Football Roundup for the Commodore 64™

Diagnosing and Treating Your Sick 64

THE Guide TO COMPUTER LIVING

April 1986

$2.50 U.S.

$3.50 Outside U.S.

Vol. No. 3
Issue No. 1
P.D.C.

A Monthly Publication For Commodore™ Owners

(Formerly The Northwest Users Guide)

"Bounty" by John Paslay

0 74470 17515 04

The Country's Most Successful Regional Publication NOW Available Nationally!

Aquarian Software Presents

Matrix

The Indispensable C-128 Utility/Starter Kit!

Use dozens of 128 features in the 64 mode:
- Numeric Key Pad
- Cursor Keys
- 80-Column RGB Output
- Many Other Special Function Keys

One-Key Functions Include:
- **2 Megahertz "Fast Mode"**
- **One-Key Screen Dumps**
- **Full-Featured DOS Utility Menu**

Other Features Include:
- Fast Loading
- Fast Copy for the 1571
- Relocatable in Memory
- 100% Transparent to BASIC

Available Now For Only

From Progressive Peripherals **$59.95**

TSDS

Kevin Pickell's

Total Software Development System

Assembler/Editor:
- Fast load, get, log and load at
- Advanced BASIC and source code editor
- Adds 38 new commands
- Full macro functions
- Allows labels 13 characters long
- Assembles to and from disk, single or dual

Sprite Editor:
- Edit up to 256 sprites in memory
- View 64 sprites at same time
- Create rotated sprites instantly
- Design sprites with joystick or keyboard

Unassembler:
- Create source code from any Machine Language program
- Easy to use–written totally in Machine Language

Sound Editor:
- Create interrupt-driven sound effects for your source code.
- Up to 3 voices controlled automatically.

Matte & Character Editor:
- Edit all 256 characters
- Screens up to 255 x 64. Hi-res & multicolor character sets.

TSDS automatically includes sprites, characters, mattes and sound effects into source code.

Includes disk and Comprehensive Manual

Now Available!

Includes BOTH 64 and 128 Versions **$59.95**

Guitar Master

by MasterSoft

The Most Powerful Music Series Ever!

Here's What You Receive:
64 lessons in seven levels of instruction including:
- Tuning–it's easy by matching programmed tones
- Guitar Chords–396 of the most useful chord formations
- Chord Analyzer–analyze the notes in any chord as they appear on the staff
- Progressions–perfect chord recall and playing proficiency with 375 chord progressions
- Pick & Strum–add mastery of 18 picking and strumming patterns to your playing expertise
- Transposing–change songs from one key to another with speed and accuracy
- Scales–learn every major scale on every fret for total fingerboard command

Also Available:

Trumpet Master
Clarinet Master
Flute Master
Saxophone Master
Singing Master

$49.95

Rhapsody 64

by King Microware

A Fully Integrated Package

Database Manager
Word Processing
Spelling Checker
Spreadsheet / Graphics

- Completely menu-driven
- Very user-friendly
- All modules reside in memory together
- Command file macros
- Programmable

64 Version **$64.95**

Lifeplan™

A Lifeware™ Product

LIFEPLAN™ is a financial planning tool designed for people without computer experience or accounting degrees. Middle-income families or singles willl improve their financial outlook with help from LIFEPLAN™.

- **Reduce or eliminate debt**
- **Establish or increase savings**
- **Manage expenses**
- **Plan for the future**

Originally $99.95

NOW

$59.95*

* **Add $4.00 Shipping and Handling For this particular package.**

Aquarian Software

P.O. Box 22184
Portland, OR 97222

VISA

MasterCard

To Order, Call: (503) 654–2641

VISA and MasterCard Accepted
Add $3.00 Shipping and Handling Per Order
Dealer Inquiries Welcome!

FOR COMMODORE 128 AND C-64 OWNERS ONLY:

BLITZ!™

NOW SHOWING AT SKYLES ELECTRIC WORKS

If your programs are slow, BLITZ!™ them

It's Spectacular
Bob has discovered a spectacular compiler for the **Commodore 64** and the **Commodore 128** that he calls ***BLITZ!***

It's Fast
BLITZ! is faster than *PET SPEED*, faster than any other Commodore compiler that has come down the pike. Your ***BLITZ!***-compiled program will run from *five to 20 times* faster than it did before you blitzed it.

It Translates
This disk program translates your slow BASIC programs into a much, much faster code. The ***BLITZ!*** compiler significantly improves the performance of your BASIC routines. It reads the entire program, reduces that program's size by deciding which operations need to only run once, interprets the operations, and then re-writes the program into its own special P-code.

It's Protective
For more advanced programmers, the ***BLITZ!*** compiler offers another benefit besides speed. It provides an almost infinite number of ways to add protection to your programs, because a compiled program is not readable. So security is inherent in the re-writing!

It's a Treasure
Using this compiler, you can now create a string of BASIC programs such that one automatically loads the next. You can also pass information from one program to another. You will find the ***BLITZ!*** compiler a treasured tool in your programming kit.

It's Popular
Reviewers and users have heaped the following praise on the ***BLITZ!***: "The ***BLITZ*** basic compiler is a dream come true for BASIC programmers." Compute!'s Gazette Jan 1985 "worth its weight in gold." TPUG Mar. 1985. "Wonderful" "Fantastic" "I can't imagine programming without it" User comments. It is even more popular with professional programmers. Many commercial programs now say "***BLITZ!***" when they are listed. The ultimate accolade for ***BLITZ!***.

C-64 or C-128

		FALL SALE
***BLITZ!* C-128, Disk**	**$129.00**	**99.95***
***BLITZ!* C-64, Disk**	**99.00**	**49.95***

TaxWare™ now available for Commodore 128

It's Available
TaxWare, the most comprehensive, easy to use, all year around record keeping and tax preparation system available for the **Commodore 64**, is now available for the **Commodore 128**. Better yet, both the improved **C-64** and **C-128** versions of this popular package are available in one comprehensive package.

It's Faster
Both versions of **TaxWare** have been speeded up using ***BLITZ 64*** and ***BLITZ! 128*** compilers. To the best of our knowledge **TaxWare** is the fastest **C-64** and **C-128** tax preparation system available anywhere.

It's Comprehensive
TaxWare handles itemized deductions, income averaging, dividends, stocks, self-employment, rents, royalties, childcare, marriage deductions and much, much more. **TaxWare** includes forms 1040, 2442, and Schedules A, B, C, D, E, G, and W.

C-64 or C-128

TaxWare stores and calculates all in one program, eliminating the need for separate database programs to store some tax items or forms.

It's Easy
HELP SCREENS are available at the touch of a button from anywhere within the **TaxWare** program. At the touch of a button, many forms are printed out in I.R.S. approved format, for direct submission. We can't make the payment any easier, but the preparation couldn't be easier with **TaxWare**.

It's Available Now
TaxWare is available now from Skyles Electric Works or your favorite local dealer. Call us at **1-800-227-9998** or **1-415-965-1735** and we will rush a **TaxWare** to you by return mail.

	TAX SALE
TaxWare, C-64 or C-128, 1541 or 1571	**$49.95***

So many cartridges, so little space . . .

Skyles Electric Works to the rescue, with our **2+1**™ and **4+1**™ expansion boards for the C-64. Briefly the **2+1** gives you 2 vertical and 1 horizontal fully switchable cartridge ports. See the inside front cover for more details. The **4+1** continues the tradition with 4 vertical and 1 horizontal cartridge ports.

		FALL SALE
Skyles 2+1 Expansion Bd. C-64	**$49.95**	**39.95***
Skyles 4+1 Expansion Bd. C-64	**$89.95**	**69.95***

*There is an additional $4.50 U.S. and Canada, $15.00 Europe and Asia, shipping charge per order. California residents add sales tax.

From Skyles Electric Works, the oldest and largest professionals in the business.

This is just a few of the 200+ bargains from the newest and biggest Skyles catalog, hot off the press.

We know you'll want this page, in its full splendor, and the other pages overflowing with over 200 bargains in peripherals, software, and books that will make your Commodore 128 or C-64 computer even nicer to live with.

So, if we missed sending you your very own copy within the last few weeks, call us at 1-800/227-9998, unless you live in California, in which case call 1-415/965-1735.

Skyles Electric Works
231E South Whisman Road
Mountain View, CA 94041
(415) 965-1735

THE GUIDE TO COMPUTER LIVING

The Guide To Computer Living
3808 S.E. Licyntra Ct.
Portland, OR 97222
(503) 654-5603

The Guide is an independent monthly publication serving Commodore computer owners. The views expressed in *The Guide* are those of the individual writers and do not necessarily reflect the views of *The Guide*, its staff, or advertisers. The acceptance of an ad does not necessarily constitute an endorsement of a product. *The Guide* reserves the right to determine the acceptability of any advertising submitted.

Letters to the editor are not only welcomed, but encouraged, and will be printed as space permits.

The Guide is published monthly (and is available by subscription at the following rates: 1 year — $18.00, 2 years — $35.00, 3 years — $48.00) by Aquarian Communications, Inc., 3808 S.E. Licyntra Court, Portland, Oregon 97222. Application to mail at Second Class is pending at Portland, Oregon. POSTMASTER: Please send address changes to *The Guide*, 3808 S.E. Licyntra Court, Portland, Oregon 97222.

TABLE OF CONTENTS

APRIL 1986

The cover art, "The Bounty", was created with **Doodle** by James Paslay.

The Guide features high quality original artwork on the cover each month. All artists are encouraged to submit their computer artwork for consideration. The only restriction is that the art must have been created using a Commodore computer. This could be your chance to move that masterpiece from the screen on your monitor to the newsstands of America! And make a few dollars in the process.

Please submit all artwork on disk, with a cover letter describing the graphics package used to create it. It will be photographed from the screen, so screen dump capability is *not* a requirement.

COMING

NEXT MONTH . . .

WORD PROCESSING

ON THE 128

RND (0) Notes:
A New Year and a New Look

by Randy Chase

Since this issue marks yet another transition and growth for *The Guide*, it seems appropriate to spend a few moments reflecting on where we've been, as well as the exciting new places we are going. With this issue we officially enter the *real* world of national circulation. For many of you, this issue will serve as your introduction to *The Guide*; yet for those of you who've been growing with us for the last two years, it's simply the latest in a long series of steps forward. At the risk of boring those old friends who've patiently followed our progress and, through their loyal support, have made all of this possible, I'd like to digress a bit (if I may) and formally introduce *The Guide* to our many new friends.

Being at the crossroads, a fleeting point of transition, is both exciting and awkward. On one hand, I stand at a point where I can watch the blooming of a dream and the reaching of a goal; on the other, I now leave the comfortable confines of what has been to move into the uncertainties of what could be ahead. As I sit and write this, three weeks before you will read it, I am somewhere in between the two. At times like this, I guess it's easiest to look back.

Once upon a time, life was simple. Somewhere along the way to getting computerized, however, things got complicated. Back there in another life, I was one of those people that not only disliked computers, but meticulously mutilated those little computer punch-card bills that came in the mail. I've often since fantasized about the chaos those carefully crafted extra holes may have caused in some poor person's system somewhere. Now, though, I've become one of those people who writes about computers, and talks about computers, and plays with computers, and yes, sometimes even argues with his wife about computers. And most ironically, I've become one of those people who publishes a computer magazine. John Lennon once said: "Life is what happens while you're busy making other plans".

The Guide was born in one of those moments of fancy when I was mourning the lack of a reliable source of regular information that would help me better deal with the "abandoned" feeling that accompanied being one of Commodore's early guinea pigs for the 64. Many of you remember what it felt like to pay $1,000 for a computer and a disk drive, only to find that the manuals were written by someone who had obviously never seen the hardware. It's truly amazing what a motivator frustration can be.

From that first month, with a faithful (and pre-paid) subscription base of 56, to the relization that this issue of *The Guide* will reach over 30,000 readers has been an educational process, to say the least. At times, it has seemed like we were tumbling head over heels down hill, with all the control and preperation of a rampaging snowball, slowly gathering about us both an ever-broadening base of readers and a gradually increasing awareness about the realities of the publishing world.

I often say, only partially in jest, that had I known back then what I know now about the realities of publishing a magazine, I would never have set this circus in motion. But we seem to have stumbled ahead, often in spite of ourselves. While our intentions and goals haven't really changed that much, the realities of the production/distribution cycle have evolved radically. Not that long ago, we could print the magazine and have it on the newstands within two or three days. The logistics of national and international distribution, however, have had a major impact in the time involved. Those "few days" have been transformed to a "few weeks", with some foriegn markets not seeing the end product for close to two months from the actual printing date. For most of our readers, this will make very little difference, other than the month that is printed on the cover.

Of more direct impact, however, is the initial time lag in beginning the cycle. Fortunately, that is now behind us. Our apologies for

this unavoidable delay between issues, and our thanks for your continuing support and patience as we take this latest step forward. (And as we've done in the past, all subscriptions will be adjusted accordingly, so don't worry that you will have missed any issues coming on your subscription.)

While you can expect to see continuing improvement and change in the cosmetics of *The Guide*, our old friends can rest assured that the changes planned are only of the cosmetic and superficial nature. The editorial direction of *The Guide* will continue forward in the spirit that has gotten us this far.

CES Update

I really expected to return from the Winter Consumer & Electronics Show with enough material for a nice lengthy story. Instead, a few words in passing will just about cover all the Commodore news. Unlike the show last January in Las Vegas, this was *not* a Commodore dominated show. Commodore's lack of partcipation prompted most major software companies to follow suit, leaving it a predominently non-computer CES. In fact, a who's who of the Commodore world could have been compiled from the list of companies that weren't present.

In many ways, it was a very frustrating show. With so much activity happening in the market place both with the 128 PC and the Amiga, it just didn't make sense for Commodore to *not* be there. And of course, by not participating, they immediately became the focal point for the rumor mill. It's ironic to remember back to last winter's show when everyone was so skeptical about Atari's ability to survive, only to realize that this year those same rumors and fears were floating around, but this time it was Commodore was the source of apprehension.

The biggest single piece of news from CES was the rumor that Atari would indeed be marketing the 520 ST through chain stores. It was also a very poorly kept secret that they were in final negotiations with an "un-named" toy store chain. It doesn't take an expert to figure out what toy store chain would be interested in the 520, does it?

I had to chuckle as I listened to Atari dealers complaining about the rumoured mass merchandising of the ST. One dealer, as we talked, was waving his dealer's contract in the air, and kept saying "But they promised me...." The only thing that surprised me about the whole thing is that anyone was surprised. Don't they realize that this is Uncle Jack? By now everyone should know what to expect. Sure, they *will* mass merchandise the ST, and the price *is* going to be discounted to the point of under-mining their dealers. And, *yes*, Jack will end up with dealers everywhere mad at him again. But along the way, he *will* sell a million 520 ST's and in so doing *will* transform Atari from a bankrupt wreck into a very profitable operation. This is fun. It's like watching the old Commodore all over again. Only this time, I'm not one of their customers (not yet, at least) complaining about their lack of support, so it's easier to sit back and enjoy the show.

While we are discussing the ST, I'd like to make a few comments about the marketing approach Atari has chosen. I personally think the 520 is a very impressive machine, when evaluated on its power and its price. But no one in their right mind can buy the "better than the Amiga" implications of their advertising and promotion. Come on, Atari, you guys have a very nice machine. Why not settle down and promote it instead of basing your ad campaign on degrading the Amiga and the Mac? In the long run, a marketing campaign with a negative theme isn't going to help anyone.

Back on the Commodore front, the few companies who were at CES were talking primarily about Amiga and 520 ST products. I was quite disappointed at the lack of "new" products in the works for the 128. Granted, there are a lot of conversions of 64 programs to utilize the features of the 128; but overall, I fear that the 128 may suffer in software development by the amount of activity under way for the bigger machines.

The thing that most impressed me about CES was the radical changes in the industry in the last year. The contrasts between the Commodore dominated show last year, and the Atari show this Janaury are monumental. Last year, we all were wondering how many months Atari could keep their doors open; this year many industry people are speculating about the impending demise of Commodore. With sales figures not readily available, its still not secret

that the 128 PC *is* selling, and most dealers are reporting that the Amiga is a very marketable machine, even with very little software yet available. One industry publication credited Commodore with 1,000,000 units sold in the Christmas season.

I really doubt that either Commodore or Atari are going to do anything but continue to dominate the home computer market; and between the Amiga and the forth-coming 1040 ST, I think both companies are going to begin making significant inroads into markets previously shared by Apple and IBM.

Many people would just be a little more assured if Commodore seemed to be taking a more aggresive role in shaping the destiney of both the 128 PC and the Amiga. Come on guys, we love the machines, but can't you do something to expedite software development for *both* machines?

The Guide Staff

Publisher & Managing Editor
Randy Chase

Associate Editor
Grant Johnson

Contributing Editor
Mindy Skelton

Staff Artists
Leslie Baird
Eddie Johnson

Photographs
Grant Johnson

Production
Bill Wallan
Leslie Baird
Steve Davis
Rick Tice

Advertising Sales
Bronwen Fitzhugh
Jim Losk

Staff Writers
Lyn Chase
Dr. Petrie Curryfavor
Bud Izzit
Eddie Johnson
John R. Olsen, Jr.
Bob Richardson
Shelly Roberts
Robert J. Sodaro

Contributors
Carmen Artino
Wesley James
Valerie Jean Kramer
Bill Pytlovany
Jim Russell
Matthew Stern

Distributed exclusively by
Publishers Distributing Corp.
P.O. Box 8991
Malibu, CA 90265
(213) 456-0030

Advertising Offices:
2962 S.W. 89th
Portland, OR 97225
(503) 297-3541

Editorial Offices:
3808 S.E. Licyntra Ct.
Portland, OR 97222
(503) 654-5603

Pigskin Review:

Football Simulations For The Computer Quarterback

by Randy Chase

For the dedicated (or obsessed) football fan, Superbowl Sunday carries with it a very conflicting set of emotions. Not only is it the culmination of a grueling and exhilarating twenty-week season (counting the sixteen-week season, three weekends of playoff games, and, of course, Super Bowl Sunday), it is also the end of the season.

After the six-hour media marathon (with the game squeezed in between pre-game and post-game shows, celebrity interviews, and presidential phone calls) there comes a six-month void. No more two-minute offenses. No more sudden death overtimes. No more missed point spreads. With the disappearance of spring-time football via the USFL (only the hard-core fan stretched the definition of professional football far enough to encompass this ill-fated venture) the football fanatic is left with bleak and empty months ahead of him. But wait, perhaps there is hope after all. With the aid of a computer, and the right software, just maybe it isn't the end of the season!

Before we launch into an exploration of computer football, let me digress briefly on the subject of sports in general, and simulations in particular. One of the things that has always captivated and fascinated me about the sporting arena is the whole concept of a form of competition where there are very clear and specific rules; a forum, if you will, where one can truly measure one person's talents and accomplishments in a direct comparison to another.

In most sports, these comparisons can be made using mathematical values and statistics, which can draw very valid comparisons because the rules are constant and uniform. Statistically, baseball is perhaps the most *perfect* sport in that every action by each individual athlete (be it a monumental achievement or a trivial happenstance) is recorded mathematically. The combination, then, of those individual accomplishments paints a very revealing portrait of the team as a whole. All sports, however, have their own method of recording mathematically the events that transpire; and can subsequently draw upon this accumulation of a statistical data base which serves a dual purpose as both the means of comparisons and the recorded history of the sport.

It was this inter-related matrix of numbers and percentages that first lured me toward the world of computers. Having been immersed in both a more-than-casual following of sports as well as growing up with a very strong and active fascination with the mathematical simulations, it seemed to be such a natural marriage. All those numbers, each important and precious, were just waiting for a computer to come along to organize and control them, revealing their secrets, unleashing their power, and bringing them to life. One of the most fascinating trends technology brought to the

sporting realm is the evolution of those old table-top simulations, complete with multiple charts and tables, cards and dice, into powerful and entertaining software programs.

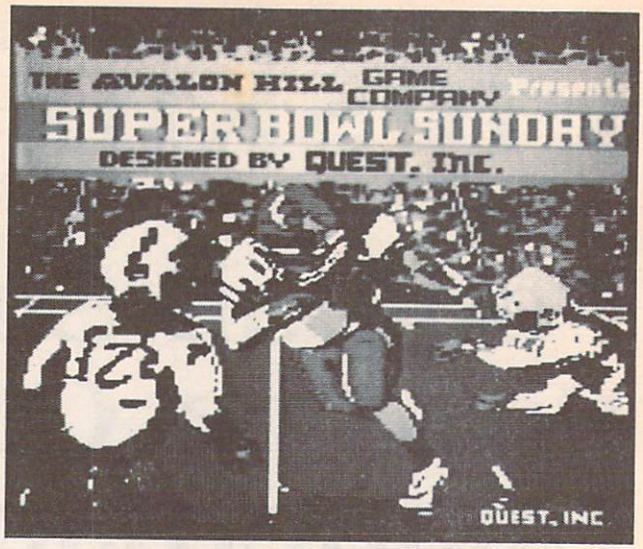
Sports fans are infected with an overpowering tendency to live in a world of second-guessing and speculation. Was Henry Aaron really a better slugger than the Babe? Were the '66 Packers really *that* good? What would have happened to the Chargers last year if they hadn't lost Dan Fouts? How would Walter Payton have compared to Jim Taylor if they'd played at the same time? These are the seeds of fantasy that can bloom into a full-grown fascination with simulations.

For some reason, sports simulations have been very slow in evolving for the Commodore. I've long been quite envious of the variety of products that have been available to Apple owners in the past, but with the variety and quality of products now being released for the Commodore, that is rapidly changing. This month we're going to take a look at some of the recent releases that tackle the world of football.

Each of the games we're going to look at offers a unique approach to the concept of computer football. Each will appeal to a different type of gamer, and each has its own strengths and weaknesses. We are going to be talking primarily about **The World's Greatest Football Game** from Epyx, Avalon Hill's **Superbowl Sunday** and **3 in 1 Football** from Lance Haffner Games, but we'll also touch briefly on some of the other related products available for the Commodore 64.

Superbowl Sunday

No, sports fans, Superbowl Sunday no longer marks the end of the football season. Make sure you have plenty of chips on hand, and perhaps you'd best pick up an extra six-pack before loading **Superbowl Sunday**. Designed by the Quest, the same people responsible for **The World's Greatest Baseball Game**, **Superbowl Sunday** combines very entertaining graphics with an engaging NFL simulation; and in the final analysis, very successfully captures the flavor and feel of the NFL. For the full season replay I conducted in testing **Superbowl Sunday**, I used primarily the auto-play mode, and let the games run on an extra computer in the office while I worked. I



***Avalon Hill's Superbowl Sunday* extends the football season for the computer quarterback.**

was quite surprised at the amount of time that ended up being spent simply watching the game play itself.

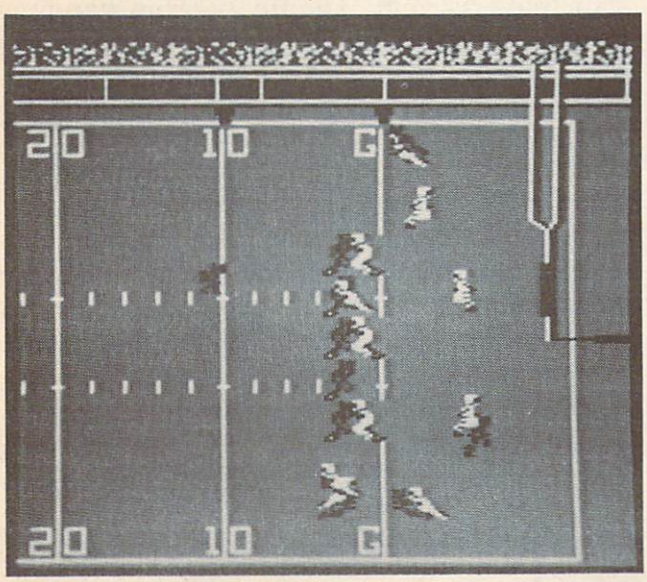
Offering three different playing modes, one-player, two-player, and an "autoplay" mode, **Superbowl Sunday** comes with teams from 10 Super Bowl match-ups, ranging from the '66 Green Bay Packers to the '84 San Fransisco 49'ers, and can also be supplemented with a disk containing all teams from the 1984 season. In both the one-player game (with the computer coaching the visiting team) and the "auto-play" mode, **Superbowl Sunday** utilizes very sophisticated artificial intelligence that allows the computer to evaluate the game at various points (including the "two minute warning" at the end of the game) and adjust its logic tables according to the game situation at hand.

For the gamer wishing to re-play entire season schedules, the "auto-play" mode is invaluable. You can choose the key games you want to personally play, and let the computer run through all those other games. An interesting twist in the "auto-play" allows outside intervention, offering the option of interrupting play at any time to call the play yourself, for either the offense or defense.

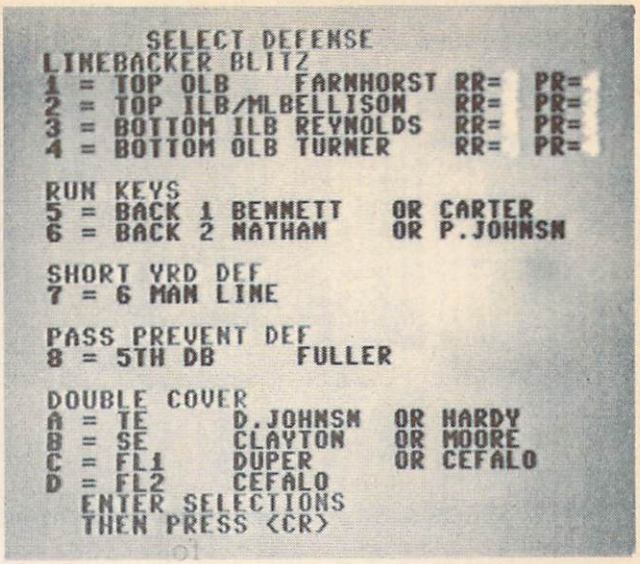
Superbowl Sunday is entirely menu-driven, with all offensive and defensive options selected from on-screen prompts of available options. For the novice, or casual fan, it isn't necessary to be familiar with the various

players on your team because season stats are displayed in the play selection menus. Offensive and defensive match-ups are also displayed at the touch of a key. Before you make that third-and-one call, you can look at the offensive and defensive lines and decide if you want to play to your strength or try to capitalize on your opponent's weakness. The helpful and informative menu selection makes decisions easy for even the inexperienced football fan, and the more knowledgeable fan will quickly appreciate the realism and detail incorporated in the game design.

While the easy-to-follow menus will appease and assist the novice level player, the more sophisticated fan will enjoy and appreciate the complexities offered on both offense and defense. On offense, you not only decide on the type of play, the ball carrier (or passer and receiver), but also the formation to use for the play. This allows for some very creative coaching. One offensive tip I'll offer is to try throwing either a pass on an obvious running play from a "three back" formation. Be sure to select the split end as the designated receiver or you'll find yourself in a two back formation. This will most often fool the defense and give you that crucial first down. On defense, the first task is deciding if you wish to call a passing, running or normal defense; then you're offered options including blitzing, keying on running backs, double-teaming receivers, utilizing an extra back in a pass-prevent defense, or calling for a short yardage defense. Enough combinations and possibilities are supported for both the offensive and defensive coaches to provide a very realistic playing environment.



Action shot of *Superbowl Sunday*. All 22 players are depicted on the screen as the play unfolds.

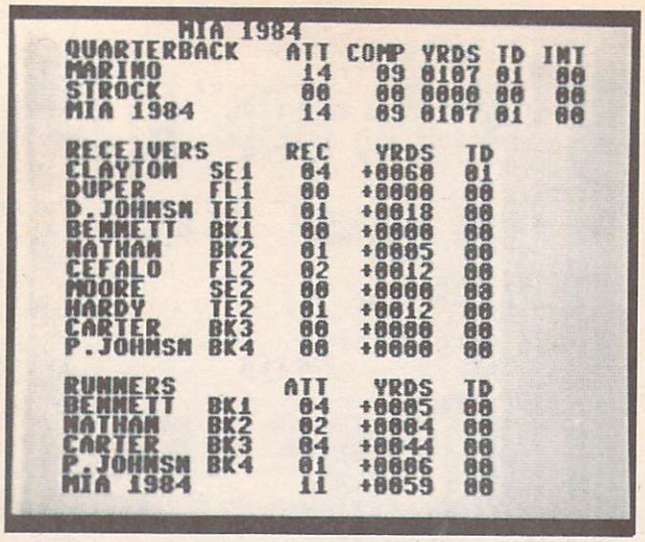


The defensive menu in *Superbowl Sunday* offers options that include double teaming receivers and keying on running backs.

After the offensive coach has selected his play, and the opposing team has set their defense, the screen shifts to the playing field where all 22 players are displayed, and the play unfolds before your eyes. Watch the running back try to get around the end on a sweep, or watch as the flanker turns and reaches back behind him to pull in that long pass. The detail and effort that went into programming such realistic and entertaining graphics makes **Superbowl Sunday** a true delight to play.

At the conclusion of the game, offensive statistics can be printed out for both teams on a neat one-page stat sheet. These stats are also available at any point during the course of the game. It would have been nice if they had also incorporated some sort of statistic compiler, similar to those offered in many of the baseball games. In fairness, thought, **Superbowl Sunday** is the only football game I've played yet that offers the ability to view the game stats at any point during the game.

My criticisms of **Superbowl Sunday** are few, and rather insignificant in comparision to the over-all quality of the package. I do feel, however, that time-outs just don't seem to reflect the strategic value they do in real life.



Superbowl Sunday **offers either on-screen or printed statistics of the game in progress.**

Also, directly related, is the lack of any form of "hurry-up" offense for use in the closing minutes. Too many NFL games are won or lost by a team's ability (or inability) to move the ball without moving the clock for this to not be included as a part of the offensive arsenal.

I also felt that a wider base of team availability would greatly enhance the long term playability of **Superbowl Sunday**. Most gamers who are intrigued by the possibilities offered by such a simulation are going to want to see just how Gale Sayers would have fared against the Steel Curtain. Any simulation offering re-enactment of a major league sport should offer the player the choice of moving across the barriers of time and creating those dream team match-ups. The set of 20 Super Bowl teams is a tease, but now I'd like to see several disks available of various teams (and/or seasons) from the past.

I also found the program to be very drive-sensitive. With seven different disk drives available in the office, I found only two that would consistently load and run the software. The protection used also prevents use of an MSD drive (and, presumably, other third party drives). I also had some problems with printer compatibility. My Okidata 120 (Commodore compatible) printer works just fine. However, my Okidata 92 never did work, even after experimenting with a variety of interfaces and settings.

The ultimate test, in my mind at least, for a game like this is its accuracy. Will it truly reflect the strengths and weaknesses of the various teams in a manner realistic enough to make the results of a replay believable? Upon receiving the disk, I immediately set out to replay a full season schedule using 16 of the Super Bowl teams provided. While the task at hand was quite enjoyable, I was left somewhat frustrated. The obvious problem in gauging the statistical validity of the game on such a replay is that the "great teams" format immediately throws off all results. How can you determine if they are accurate? The '68 Jets didn't have to play the '84 Dolphins in their "real" season, therefore it's impossible to judge the validity of the resulting statistics since you have no real reference with which to compare.

In case you're curious, the '68 Jets finished that replay with an unblemished record (but only after scoring a last-second field goal in the final game of the season to beat the '73 Dolphins and remain undefeated). In the playoffs, however, the '66 Packers came to life and blew the Jets out in the Super Bowl.) The ads hint that one of the 20 teams will beat most of the other teams. My guess (based on my testing/playing) is that the mystery team is Broadway Joe and the New York Jets.

In order to better determine the statistical accuracy of the game, I decided that it was necessary to re-play the entire '84 season in order to have results that could be compared to something relevant. The final season standings from that replay can be seen elsewhere on this page, with the real season records also shown. You can draw your own conculsions. I, however, was quite pleased with the results. There were some very obvious variances from the real world, but it's important to keep in mind that in order to adequately test the true accuracy of a statistical simulation it would be necessary to replay the season hundreds of times, and then measure the validity of the volume of statistics produced. All in all, I was quite pleased with the results. A few teams surprised, and a few teams disappointed, but overall the results were well within the realm of acceptable accuracy.

3 in 1 Football

Lance Haffner Games has taken a rather

different approach to the same programming challenge. Stripped of the graphics, and with the program controlling player selection, **3 in 1 Football** plays remarkably fast and seems to offer a higher degree of statistical accuracy than **Superbowl Sunday**. Again, the gamer is afforded the option of both a one- or two-player version, as well as an auto-play mode. One of the most striking features of this package is that it is indeed three games in one, combining on the same disk versions for NFL, and USFL, as well as college football. All rule changes and playing differences are taken into consideration.

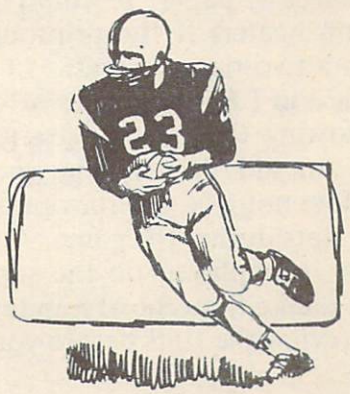
Retailing at $29.99, **3 in 1 Football** comes with 167 college teams from the '84 season, as well as the entire NFL and USFL. Several disks of teams from the past are available, giving Haffner's package the undisputed edge in team availability. All are also very modestly priced. The entire package is not only free of copy-protection, but encourages the user to protect himself by making a back up.

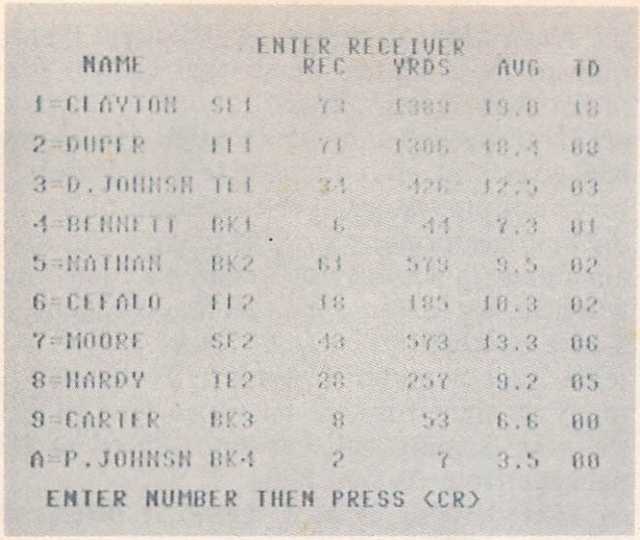
Other than the absence of graphics, the biggest single difference in the play of **3 in 1 Football** as compared to **Superbowl Sunday** is that the coach selects the play he wishes to call, and then instead of proceeding to choose a running back or a receiver, the software selects the player based on actual player usage. While this does take away some options from the keyboard coach, it also is the key to **3 in 1 Football**'s greater degree of statistical accuracy. The most common failing in a statistical simulation is the irresistable impulse of the coach to over-use the better players. Let's face it, if you are coaching the Dallas Cowboys, it's hard to *not* keep giving the ball to Tony Dorsett. **Superbowl Sunday** deals with this by having the game compensate for over-use by reducing effectiveness if a player is used on too many consecutive plays. Haffner, however, simply allows the software to choose the quarterback, running back, and receivers based on their actual performances for the team.

The drawback of this approach, however, is that in any game there are situations where it can be quite frustrating to not be able to call on your best player. For instance, imagine that it's late in the game, your coaching the Chargers, and you trail by five points. Can you imagine the frustration of calling for the long bomb, only to have Luther throw that critical pass rather than Fouts? Those instances, however, are far out-weighed by the fact that **3 in 1 Football** gives you, over the course of a season, a very accurate statistical re-enactment of the individual performances of the players. Another advantage that helps out-weigh this sometimes irritating restriction is the fact that the teams in **3 in 1 Football** utilize many more players per team than **Superbowl Sunday**. Teams use as many as eight running backs, instead of just the four leading ball carriers offered in the package from Avalon Hill.

On defense, **3 in 1 Football** offers six defensive options, with none of the double-teaming and keying features offered by **Superbowl Sunday**. On offense, however, there are some very significant features added to the offensive aresenal, including the draw play, roll-out passes, and most importantly, a sideline pass play that is only available during the last two minutes of the half. The combinination of this sideline pass, a timing system that does a much better job of making time-outs a realistic strategic tool, and the provision for a hurry-up offense gives **3 in 1 Football** the real edge when it comes to capturing the feel of playing against the clock in the closing minutes of the game.

For the gamer interested in conducting full season replays, the speed of play for **3 in 1 Football** will be very enticing. Full games, in





Receiver menu in *Superbowl Sunday* offers choices and provides player statisistics as a coaching aid.

the auto play mode, are finished in less than 15 minutes. Playing against the computer adds very little additional time, unless, of course, you sit there between plays contemplating your navel for too long.

Another plus is the very thorough statistics provided at the end of the game to either the screen or the printer. Unlike the "highlight" approach of **Superbowl Sunday**, Haffner offeres a *full* statistical summary, including penalties, kick returns, field goalds and extra point kicks, and a scoring summary. However, I was annoyed that it takes two pages to print the full stat sheet out, and there are no provisions for "paging", so the report prints right over the perforation on its way to the next sheet of paper. It would be nicer (not to mention neater) if the printouts were formatted in a two-page format.

While **3 in 1 Football** does offer a scouting report showing the relative strengths of both teams as an aid in selecting your offensive plays, it does not give you the option of reviewing game stats during the game. A summary of team stats is displayed on the screen at halftime, but unlike **Superbowl Sunday**, you can't stop and review the stats before you select your next play.

Overall, I was quite impressed with **3 in 1 Football**. Unfortunately, due to an ever-pressing deadline, I was unable to complete the '84 NFL replay using **3 in 1 Football**. From the partial season completed thus far, it does appear that it will prove to be more accurate than **Superbowl Sunday**. That is due to several factors, primarily having more players per team and automatically using them the same percentage of the time that they were used in real life.

Haffner, incidentally, already has a team disk available with all college and NFL teams from the '85 season! The timely release enables gamers to play the current bowl games and play off match-ups without waiting a year for a new data disk to become available. Haffner has announced the release of a basketball simulation for the 64. Both the college and NBA versions should be available by the time you read this.

World's Greatest Football Game

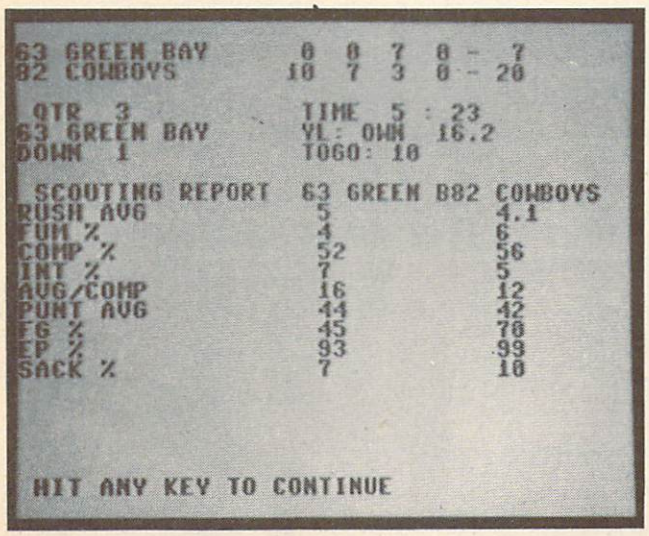
For the gamer more interested in getting involved in the physical play of the game, **The World's Greatest Football Game, (W.G.F.G.)**, from Epyx will be quite appealing. Yet another in their growing series of surprisingly realistic sports arcade games, **W.G.F.G.** offers a unique blend of joystick action and simulation level strategy. Divided into two modes, Play Game and Chalkboard, this package will appeal to a variety of gamers. For those preferring a good workout on the joystick, and who enjoy graphic displays, this is a *must*. For the fan that's always wondered what it would be like to play with all of those fascinating X's and O's that never quite made sense, here's a golden opportunity to get a little chalk on your hands. (Figuratively speaking, of course!) And once again, Epyx is at the forefront in defining what can be done with the graphic capabilities of the 64.

In the game mode, the player (or players) control various players on the field with the joystick as they execute the carefully-designed intricate offensive and defensive plays. The multiple view approach offers an interesting approach to the graphic display. Players can toggle between a multi-screen view, or choose either the overhead or side-line view of the playing field. As illustrated in the accompanying photographs, this offers a truly original perspective of the unfolding plays. The joystick commands require both practice and patience to master, but this is offset by the speed command that begins the actual play ex-

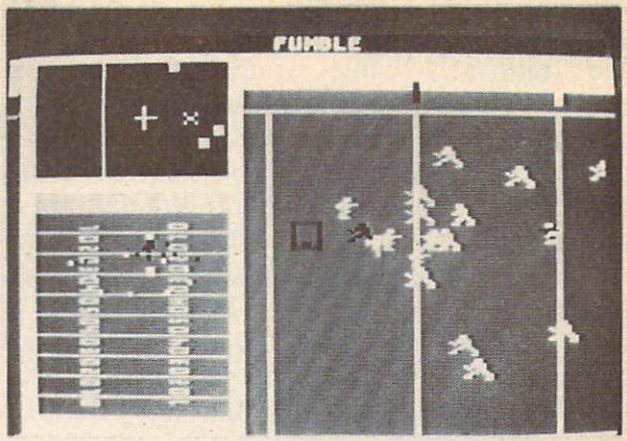
ecution. If you're learning, keep the speed very slow, and you'll have the handicap of playing a game that is unfolding in *slow* motion. An option is even available to view the play in a "stop action" sequence, frame by frame.

The real appeal in **W.G.F.G.** for the football fan lies in the chalkboard mode, where both offensive and defensive plays can be diagrammed and saved for later use in a game. Not only is **W.G.F.G.** a delightfully entertaining game, but it also serves as a very practical tool for learning to appreciate the intricate inner-workings of both offense and defense. In the chalkboard mode, the gamer has the ability to start from scratch and custom design his own offensive and defensive plays. Working from the menu prompts with a joystick, full control is excercised over the actions of all players. Documentation is very thorough, and even the most sophisticated fan will be satisfied with the detail involved.

One shortcoming, however, of **W.G.F.G.** is that it is a very disk-intensive game, with both offensive and defensive plays being loaded from disk. If two gamers have both created their own "play book" disks, which are able to hold a total of 126 individually designed plays, they will also have to constantly shuffle disks in and out of the drive. One other major criticism I had was that in the one-player mode, the computer *always* plays defense. Granted, running the offense for the most part



Even without graphics, *3 in 1 Football* is a *MUST* for the gamer seriously interested in statistical accuracy.



Epyx offers a unique multi-perspective display in their *World's Greatest Football Game.*

is more fun, but when you are trying to design your defensive plays, it would be more practical to be able to control the defense against the computer. As it is, the only way you can practice (or test) your defense is in a real game situation.

On-Field Football

There are a few other football games on the market that warrant at least a passing mention. **On-Field Football**, from Game-Star is a delightful action game. Utilizing an intricate set of joystick controls that require some practice to master, **On-Field Football** is a wide-open game, very reminiscenct of the sandlot games of our youth. For the gamer looking for excitement and "on-field" action, **On-Field Football** is a winner. As with most Game Star releases, it supports both two-player games, as well as a one-player mode with the computer providing a very challenging opponent.

For the gamer not wanting to waste time with the time-consuming disk access and play selection process of **W.G.F.G.**, this is probably the best football action game on the market. Play selection, as well as all on-screen action, is controlled from the joystick. For an action game, the offensive and defensive options are quite numerous, even including the ability to change the play at the line of scrimmage via an "audible".

And Then ...

Computer Quarterback from Strategic Simulations attempts to offer the gamer a very

detailed strategic encounter, but is hopelessly dependent upon disk access. Play is delayed too frequently while waiting for the next routines to be loaded into the machine. Every time the ball is kicked, it seems that the program practically reloads into memory. A nice idea, but the program just doesn't live up to the concept teased by the packaging.

The earliest football release for the Commodore 64 was **Computer Football Strategy** from Avalon Hill. It really doesn't warrant comparison with the more recent, and far superior products now available. From the documentation, it appears that this might have been an interesting game, had the features from the Atari version been included in the Commodore package. I would have to rate this as a "don't bother", unless you see it in the bargain bin.

In Conclusion

While all of these products obviously deal with a very similar topic, football, they are all quite different in both their play and their approach. It's just not possible to say one is the best, for each have their own unique appeal. For the gamer who is looking primarily for a very realistic simulation, it's hard to go wrong with **3 in 1 Football**. It has been programmed to provide the utmost realism, with the minimum of frills. Both the speed of play and the wide range of teams available will make this a hands-down winner for those inerested in conducting full season replays. For the gamer with a casual interest in football, but who wants to play with real teams, **Superbowl Sunday** is a delightfully entertaining game. The graphics and sound will be a large factor for most gamers, and it is realistic enough to please all but the most statistically oriented. With its on-screen references and statistics provided, it is a very easy game for a novice to play with most of the relevant information needed to make decisions provided within the frame work of the game.

For gamers wanting football action, my first recommendation would be **On-Field Football**. From strictly an action basis, it's hard to beat the wide open style, with no disk delays interrupting play. **The World's Greatest Football Game** is a beautifully designed package for those interested in the intricacies of play design; but with the disk access delays, the action-oriented gamer will probably be annoyed with the waiting.

All in all, it's a joy to have such a diverse range of quality products to choose from. No matter what your preference, football season no longer has to end with Super Bowl Sunday.

■

SUPERBOWL SUNDAY SEASON REPLAY

American Conference

East Division	W	L	T	PF*	PA*	Real Season Record W	L	T
Miami	11	5	0	494	319	14	2	0
NY Jets	11	5	0	395	308	7	9	0
New England	7	9	0	317	368	8	8	0
Indiana	5	11	0	284	404	4	12	0
Buffalo	5	11	0	323	439	2	14	0
Central Division	**W**	**L**	**T**	**PF***	**PA***	**W**	**L**	**T**
Cincinnati	9	7	0	375	314	8	8	0
Cleveland	8	8	0	312	322	5	11	0
Houston	7	8	1	307	384	5	11	0
Pittsburgh	7	9	0	426	427	9	7	0
Western Division	**W**	**L**	**T**	**PF***	**PA***	**W**	**L**	**T**
San Diego	14	2	0	467	330	7	9	0
Seattle	10	6	0	393	276	12	4	0
Denver	8	8	0	311	294	13	3	0
LA Raiders	6	10	0	316	375	11	5	0
Kansas City	6	10	0	334	419	8	8	0

*** PF stands for Points For; PA stands for Points Against**

National Conference

East Division	W	L	T	PF*	PA*	Real Season Record W	L	T
Dallas	10	6	0	369	368	9	7	0
Washington	8	8	0	282	252	11	5	0
NY Giants	8	8	0	315	334	9	7	0
St. Louis	7	9	0	345	345	9	7	0
Philadelphia	6	10	0	246	262	6	9	1
Central Division	**W**	**L**	**T**	**PF***	**PA***	**W**	**L**	**T**
Chicago	12	4	0	328	271	10	6	0
Tampa Bay	9	7	0	363	328	6	10	0
Green Bay	8	7	1	425	350	6	10	0
Minnesota	6	10	0	315	429	3	13	0
Detroit	1	14	1	257	446	4	11	1
Western Division	**W**	**L**	**T**	**PF***	**PA***	**W**	**L**	**T**
San Fransisco	11	4	1	427	282	15	1	0
LA Rams	10	4	2	388	296	10	6	0
New Orleans	8	8	0	350	301	7	9	0
Atlanta	3	13	0	277	480	4	13	0

*** PF stands for Points For; PA stands for Points Against**

The Inside Story:
Diagnosing Your Sick Commodore

by Jim Russell
and Grant Johnson

You probably know the feeling. You're driving down the road when suddenly your car begins to make a noise that you've never heard before. Whatever was on your mind is quickly replaced by concern for what could be wrong. You begin a question and answer review of what you know about how a car is supposed to work. If you are like most people in these technological times, there are lots of questions and appallingly few answers.

Now, the two most expensive words in the English language, after "I do", are "fix it". The utterance of those words (either set) are not to be taken lightly. When I am approached by a mechanic, I search my brain for something knowledgeable to say. I may not know enough about the problem to be dangerous, but I want him to think I might. Most people are honest, but he may have gotten into trouble with the first set ("I do") and I don't want him looking for the solution to his alimony payments under my hood.

Cars are one thing, and computers are another. After all, most of us at least grew up around cars. Even if we don't know the first thing about fixing them, we all know that they have motors, batteries and transmissions. Computers have taken the world, and us, by storm. What's under the computer's "hood"?

If you want to know how your body works, ask a doctor. Following this reasoning, the place to get a down to earth, practical explanation of how a computer works is from the person who knows how to make them well when they are ill.

One such person is Jim Russell. Jim is a slightly graying man with firm hands and a ready smile. He has been doctoring mainframe computers for 25 years, has his own service company, and, in recent years, has combined hobby and work into an authorized Commodore Service Center.

We have celebrated the joys of healthy and well-fed computers on many a page in this magazine, and thought it time we ask Jim to take us on an inside tour. A tour to give us some idea about what makes our computers tick . . . and not.

Grant

Let's start from the outside and work our way in. The source of both your computer's electrical power and its greatest cause of trouble is the power pack. The power pack is that little black box that plugs into the wall outlet. It actually contains two power sources, nine volts alternating current (AC) and a regulated five volts direct current (DC). Voltage is a measure of potential energy, like water stored behind a damn. Ten volts is twice as deep as five volts. Direct current is like smooth water, and alternating current has a regular wavy surface. The batteries in a flashlight deliver direct current while the wall outlets in most American homes provide alternating current (60 waves per second).

Those of you who are into programming probably know that computers store and manipulate information in a two-state, or binary, form. These little bits of information are represented physically in the computer's circuitry as high and low voltages. Now if *you* were trying to make sense out of highs and lows, you probably would find life much simpler if you started with smooth DC. Like you, your computer prefers to make its own waves. In fact, it depends on the power pack to make the DC it needs as constant (regulated) and smooth as possible. The five-volt DC produced by the power pack is used to power the computer's logic components such as the microprocessor, memory and such.

Although your computer's appetite for current is primarily satisfied by the five-volt

DC, it does have other needs. The nine-volt AC supplied by the power pack is used internally for a variety of purposes. For example, two parts of the computer need to communicate with the outside world, and that requires still other voltages. These other voltages are created with the power by the computer itself from the nine-volt line. The Sound Interface Device (SID) chip and the Video Interface Chip (VIC) need twelve-volt DC to control video screens and audio amplifiers. After being transformed to five volts *AC*, power from the nine-volt line also finds its way into circuits (the two complex interface adapter chips) and is used for "time of day".

Loss of the nine-volt AC, results in a blank screen, but your power light *will* be on. On the other hand, if you lose your five-volt DC from the power pack, the power light will be off. In either case you'll see nothing on the screen. A lot of people get confused by this. They see the power light on and decide that the power pack must be good. That's not the case; it's just that the power light happens to run on five volts.

The power pack is the weakest link in the computer. To prevent problems, you can protect the power pack with surge protection (in the voltage strip or outlet where it gets its power). That is only a precaution, and not fool-proof.

Keep it cool. It should be put on a hard surface rather than a rug, especially where it might sink into the rug. Keep it out of sunlight or any place where there is a heat source. You will notice on most of the power packs that there are little ridges around the outside. Those are fins, and they help dissipate heat like a radiator on a car. If you put it in the sunlight or near a heat source, you are defeating their purpose.

Some people wonder about leaving power packs plugged in all the time since they stay warm. It's warm because it is still working--even when the computer is turned off. There are two theories on whether to leave them plugged in or not. Some technicians prefer leaving solid state (transistorized) equipment running all the time, and have pretty good luck. All else being equal, such equipment will last longer if it is left on continuously.

The other theory is that just one voltage bump might blow the power supply. The person that leaves his plugged in all the time is taking a chance that there isn't going to be a bump ("surge") on the power line. Pull the plug and that can't happen.

Russian Roulette

There are lots of parts to a computer system and the quick way for an owner to narrow down which part is causing a problem is to swap parts with a friend. If two computers have the same problem with a disk drive, the problem is likely to be in that drive. There is one time when this practice should always be avoided: *NEVER TEST A POWER PACK ON A SECOND COMPUTER!* When a power pack malfunctions, it can *kill* the computer. Give it another computer, and it will probably kill that one *too*. You may find out that the power pack is bad, but you will then have two computers (and maybe a friendship) to repair.

Gamblers can plug a good supply (but, are you sure?) into a suspect computer. Sick computers can hurt power supplies too, but the odds are better. Keep in mind that if the computer *does* damage the power pack, you can say good-bye to the power pack. Power packs that come with Commodore 64 computers are not repairable. Generally, if you are going to have your machine serviced, it is best to think of the computer and supply as one unit. Take them in together.

The Computer Proper

All the power going into the computer is controlled by the switch on the side. When you turn this switch on, you are connecting the power pack with the computers circuitry. Nothing happens immediately on the screen, as there is a delay by the reset circuitry (an R-C network) in the computer. It will cause a reset pulse that lasts about a half-second. This pulse resets all the microprocessor logic. Eventually it will cause the Program Counter (PC) register inside the processor to be loaded with the starting address of the operating system or Kernal. The computer also checks its memory during the reset process, and if something is amiss, you may see an "OUT OF MEMORY ERROR."

Announcing a New and Practical Application

ComputerEyes™

What can be done with **ComputerEyes**

- Make Custom T-SHIRTS, Scarfs, etc.
- Computer art
- Exchange "digitized" pictures
- Pattern Recognition
- Robotics
- Literally hundreds of practical applications
- Capture real-world images
- Plugs into the Game I/O port
- Save "pictures" to disk
- Print out all images with such packages as; PRINT SHOP, DOODLE, NEWSROOM, KOALA, etc.
- One year parts and labor warranty
- High Quality B/W video camera also available
- Full software support
- Join "free" public domain ART GALLERY exchanges
- **ComputerEyes** interfaces easily to any source of standard NTSC or industrial video. Including:
  - Video Tape Recorders
  - Video Cameras
  - Videodisks
  - TV Receivers with video outputs
  - Other computers

YES! I would like to make computer portraits.

YES! I want my computer to "see".

YES, Please send me **ComputerEyes** as follows:

_ C-64 **ComputerEyes**	**$109.00**
_ Doodle Compatible Software	**11.00**
_ Print Shop Compatible Software	**11.00**
_ Koala Compatible Software	**11.00**
_ Flexi-Draw Compatible Software	**11.00**
_ PANASONIC/IKEGAMI Commercial grade B/W video camera with interface cable	**139.00**

"UNDERWARE" ribbons (to make iron-on transfers)

_ Black (for Epson MX 70/80/82, Okidata, Star Gemini)	**12.00**
_ Color Pens (set of 5)	**12.00**
_ Jumbo Color Pen Set (set of 7)	**15.00**
_ Iron-on Coloring Kit (Contains 20 Sheets of transfer paper and a set of 5 pens)	**15.00**

FOR VISA/MASTER CHARGE ORDERS CALL Toll Free
1-(800)-523-2445, x48
(Pennsylvania residents call 800-346-7511, x48)

OR Send CHECK/Money Order and all inquiries to:
HAL Systems, P.O. Box 293, Scotch Plains, NJ 07076

Please Note: For COD Orders, add $5.00; NJ Residents calculate 6% tax.
Prices include shipping and handling.

YOUR NAME _____

ADDRESS _____

_____

HAL Systems, PO Box 293, Scotch Plains, NJ 07076

*****Dealer Inquiries Invited*****

What we have been discussing so far is a sort of vascular system pumping life-giving current from its power-pack heart to the other organs of the computer. A quick overview of how these organs are joined within the computer is in order before we proceed.

BBusing — Electrical Integrationb The nervous system that ties the computer's organs together is the so-called bus. What we have here is a happy community of chips that share a sort of multi-circuit party line. In addition to the power lines, the bus has other important groups of lines; two of which are the address lines and the data lines. As you might suspect, the data lines are used to transfer information or data around in the computer, and the address lines are used to control where that data comes from and goes to.

To give you a feel for what's going on here, we'll look at a couple of typical operations.

1. Let's say that the microprocessor needs to store a character in memory. The processor puts the intended address on the address bus (line numbers A0 through A15). Next, the processor places the byte of data on the data bus (lines D0 through D7). Memory then stores the data at the intended location.

2. Later, the processor needs to retrieve that stored data. It puts the address back on the address lines, and the memory responds by placing the stored byte of data on the data lines. The processor reads the data from the data lines, and we have come full circle.

We skipped over a detail in this essentially simple process. The same data lines are used to move data both from memory to the processor and from the processor to memory. How's memory to know whether it is supposed to catch or pitch? The answer is yet another line in the bus: the Read/Write line. When the processor wants to store a byte, it sets the Read/Write (R/W) line to write. Thus, when memory receives the address information, it knows that it is to "write down" or store the data in that location. Conversely, when the processor wants data from memory, it sets the R/W line to read, memory looks at the address and responds with the desired data.

You may see the terms "address bus", "data bus" and "control bus". This is just a way of referring to parts of the "system" bus by their separate functions. From this point of view, the read/write line is a part of the control bus.

From the programmer's point of view, nearly everything of interest in the computer is connected by the bus. Physically, that is not far from true as well. Sharing the bus are memory (both Random Access and Read Only), the microprocessor, the Sound Interface Device, the Video Interface Chip, both of the Complex Interface Adapters (CIA), a host of support chips and even the Expansion (game) Port. This is one of the better reasons for not opening your computer for a casual inspection. Unplug the power supply and the computer itself will not be dangerous to you, but *you* can be deadly to it. During periods of low humidity, it is easy to build up a charge of static electricity in our bodies. Anyone who has reached for a door knob only to be bitten knows, first hand about static charges. Should you touch a data or address line with a charged finger tip, the effect could be devastating.

Timing

With so many components all using the same party line, a strict form of etiquette must be enforced. Most essential of all, the components must have some way of taking turns on the line. Like the drum beat aboard a Roman war ship, the "clock" sets the pace. In the case of the computer, the drum is a tiny crystal "vibrating" millions of times a second. The "tick" of the clock is heard throughout the (control) bus. It enables the memory chips to know precisely when to place data on the data lines, and tells the processor precisely when to pick them up.

The master clock circuit, for systems sold in this country, puts out 14.31818 million cycles (called mega Hertz or MHz). This signal is divided down to 8.1818 MHz to become the so called "DOT clock, and the two signals are used in the video output (giving our machines color output, etc.) The VIC chip further divides this down to 1.02 MHz and makes it available on the system bus as the "Phase 0" clock signal. (The microprocessor produces its own inverted version of this signal, known on the bus as "Phase 2".) The two versions of this 1.02 MHz are ultimately responsible for keeping our community of chips in step.

So far, we have looked at the computer's power source and the bus that connects the components within. Next, on our under-hood tour, we will look at some of the major components — with particular reference to their malfunctions.

Memory

There are two kinds of memory chips in most computers. Random access memory (RAM) is like a blank slate on which things may be written or read as work progresses. It is called random access simply because you can access any part of it with equal ease. Anything stored there is lost when the computer is turned off. (Some methods of storage, such as magnetic tape, require that you to look through a sequence of locations to find the item you want.) The other type of computer memory, called read only memory (ROM), is similar to RAM except that it may not be written to; and, best of all, it is *not* erased each time the machine is turned off.

RAM

There are eight random access memory chips in the '64. Each chip keeps track of one *bit* from each memory location. You can think of them as eight arrays of bits, each 64K (65,535) in length. If you want the first bit of memory location 12, you will find it in location 12 of memory chip "zero". The second bit will be in memory chip "one" at the same (12th) location. Technically these chips are said to be "1 by 64K" chips. The essential feature to remember is that in order to recall any single *byte* of memory, all eight chips must respond. If one chip is missing, then the computer will, in effect, have no functioning RAM memory at all.

There are frequently problems with random access memory, particularly after a power supply has gone bad. Power supplies can fail in one of two ways. Either the voltage drops below what it should be, or it goes too high. There is a voltage regulator in the power supply that should prevent this from happening. Most electrical components behave differently as their temperature changes, and the voltage

regulator has parts designed into it that are supposed to compensate for temperature changes.

When this compensation fails, the five-volt supply can increase. Often you will see a power supply that, when turned on cold, will have exactly the correct voltage. But, as the supply warms, the voltage will creep upwards. The point where something's going to give is near 5.5 volts. When this happens, usually the memory chips go first, and they go in groups; two, three or four chips at a time. Memory chips are cheap, but they are all soldered in place and are not easily changed. In addition to the problem of deciding which chips are bad, there is the potential problem of static electricity damaging the chips while they are being handled.

An individual memory chip will usually fail completely. The third bit in every location of memory will go out, for example. When that happens, the computer will not function, and you will see only a blank screen. When a whole chip goes bad, it will sometimes feel much hotter than the others.

Occasionally, only one bit within a chip will quit. When this happens, the computer may seem to be functioning fine *most* of the time. Special diagnostic programs that exercise every bit in memory, must then be run to locate the problem.

ROM

Read only memory contains the programs and information that enable the computer to speak BASIC (in the BASIC ROM chip), work with the disk drive and other peripherals (in the KERNAL ROM chip) and even how to form the characters on the screen (Character ROM). Things can also go wrong with read only memory. For example, it is not uncommon to see a sick computer which will display a screen with a border and nothing else. That's usually a BASIC or KERNAL problem.

Memory with a Switch

Due to the nature of binary arithmetic, the largest address that can be put on the 16 address lines in the bus is 65,535 or 64K. What this means, in short, is that any location within memory must have an address between 0 and 65,535. When the engineers designed the Commodore 64, they wanted to maximize this "address space". In a sense, the bigger a machine's address space, the bigger its universe. To start with, the 64 was given a complete set of ROM — 64K. Added to this were the RAM chips that contain BASIC, the KERNAL and Character ROM. The 64 also uses memory addresses for input and output ports and a large variety of registers to control sound and video functions. The memory requirements for all this, *without counting RAM at all*, comes to a third of all possible addresses. In order that you might have your cake and eat it too, the engineers used a technique called multiplexing.

In this scheme, devices are made to share the same addresses. While running a machine language program, you may, for example, switch out the un-needed BASIC chip and use the space instead for more RAM. What we are talking about is a machine with reconfigurable memory. Memory is switched in or out as needed. The microprocessor may decide what address to put on the address bus, but it is the Programmable Logic Array (PLA) that controls just which chips get to "see" that address.

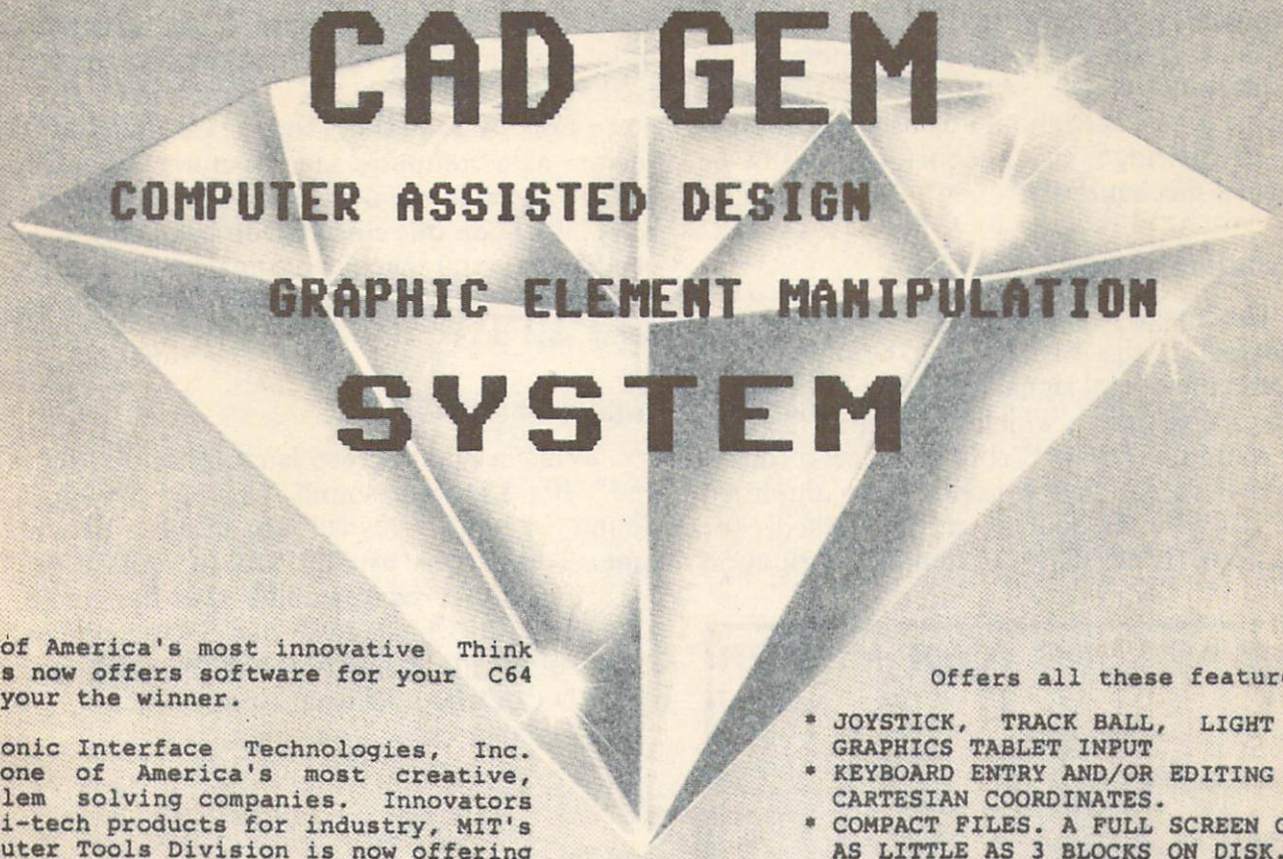
Programmable Logic Array

The Programmable Logic Array controls all your I/O and ROM address decoding and your expansion port decoding by addressing. There are four address bits that go into that chip. You may have noticed that all your I/O addresses start (in hexidecimal) with "D" as the most significant bit. The VIC IC, Sound IC, Color RAM, CIA1 & CIA2 and even the Character ROM are all addressed with "Dxxx". The PLA is a multiplexer — a sort of switchboard. It steers the addresses to where they are going; which devices are going to be talked to. While the microprocessor is the chief, the PLA is the traffic cop in the computer.

Data and Address Line Problems

When looking for trouble, you must always keep in mind that nearly everything is tied together by the bus. A bad SID can make memory chips look bad by interfering with bus operation. Also the ports such as the game, ex-

MIT OFFERS C64 SOFTWARE



CAD GEM

COMPUTER ASSISTED DESIGN

GRAPHIC ELEMENT MANIPULATION

SYSTEM

One of America's most innovative Think Tanks now offers software for your C64 and your the winner.

Micronic Interface Technologies, Inc. is one of America's most creative, problem solving companies. Innovators in hi-tech products for industry, MIT's Computer Tools Division is now offering software of incredible power at astoundingly low prices.

Computer Tools was founded by software pioneer, Wesley James, the inventor of Program Development Language, the most effective software development environment developed in the last 20 years.

Their first product for the C64 is now available.

Imagine, all the power of a $15,000 CAD system at only $89.95.

Offers all these features:

* JOYSTICK, TRACK BALL, LIGHT PEN OR GRAPHICS TABLET INPUT
* KEYBOARD ENTRY AND/OR EDITING OF TRUE CARTESIAN COORDINATES.
* COMPACT FILES. A FULL SCREEN OCCUPIES AS LITTLE AS 3 BLOCKS ON DISK.
* 360 DEGREE ROTATION IN .1 DEGREE INCREMENTS.
* SCALING, DISTORTION, & TRANSLATION TO .0001 DEGREE ACCURACY.
* 64K X 64K X 64K, 2048 MEGABIT VIRTUAL SCREEN RESOLUTION.
* INDEPENDENT MANIPULATION OF 400 OBJECTS (500 POINTS OR LINES).
* SINGLE, DOUBLE, & QUAD DENSITY SCREEN DUMPS ON APPROPRIATE PRINTERS.
* SCREENS ARE USEABLE IN YOUR PROGRAMS AND ALL OTHER GRAPHICS PROGRAMS.

IDEAL FOR PROFESSIONALS OR HOBBIEST

WOODWORKING BOAT BUILDING ELECTRONICS MODEL MAKING METAL WORK
TOOL & DIE WORK HOME DECORATING INTERIOR DESIGN
MOLD MAKING GRAPHIC ARTS PATTERN MAKING ETC, ETC, ETC

BEN DUNNINGTON-INFO 64-"We were quite impressed".

PETE BACZOR-CBM USA-"The most amazing software I've seen this year(85)"

$89.95 – Complete System **$3.00 Demo Disk Only**

Available through your local Commodore software dealer.

Dealer Inquiries Welcomed! (503) 654-2641

pansion and controller interfaces are not buffered (protected). When people plug things in live, they directly effect the bus and can damage almost any of the key parts of the computer. If the instructions say to turn off the machine before inserting, then *TURN IT OFF*. Some of the people that work with injured computers recommend that you not plug so much as a joystick into the control ports while the machine is on. Also, even when the machine is off, care should be used when plugging in cartridges as the port can easily be damaged mechanically.

Getting the picture

The image you see on the screen of the 64 is created by the VIC chip. It combines and converts the digital signals within the computer to an analog signal, which is, in turn, fed into your monitor. The VIC chip produces a finished signal except that it needs to be amplified (and a radio frequency carrier added, for television). The VIC takes digital information from several places and combines it into a picture signal. The color information, for example, is taken from the color memory chip (D800 through DBFF, hex). When a programmer wants to change a color, he can poke a value into that chip.

The symptom you see most often is a blank screen, simply because it can be caused by almost anything in the machine or power pack. Ironically, the VIC chip itself almost never fails. A good thing too, as Commodore's success as a computer manufacturer from the VIC 20 through the 64 and now to the 128 PC rests largely on this chip. If you have ever watched a $3000.00 machine struggle with a poor imitation of a familiar game, you know what is being said here.

Digital Laryngitis

While a blank screen is rarely caused by a bad VIC, a lack of sound *is* caused by a bad Sound Interface Device, about 80% of the time. The cure is usually just to replace the SID, but other causes might be the audio amplifier (in which case the SID can't be heard) or an addressing problem (in which case the SID can't be told what to do).

Conclusion

It is a good feeling, especially when there is trouble, to know that you *can* fix things. Yet, we have not tried to make service technicians out of you with this article. If you are really interested in servicing your own computer, there are several repair books on the market (one of the best is **Commodore 64 Troubleshooting & Repair Guide** by Robert C. Brenner, Howard W. Sams & Co., $18.95). Most people lose interest when they discover that the set-up cost for a basic service bench starts at about ten times the price of a *new* computer.

We do hope, however, that you now have a better idea of what's "under the hood". In any case, you'll have something more to think about the next time you "hear a noise you've never heard before . . . ".

■

I'm Sorry, But I Don't Speak Hexidecimal

When Did I Become A Computer Nerd?

by Shelly Roberts

When did I become a computer nerd?

I used to be such a normal person. I ate Twinkies and Big Macs. I lusted after a summer house on the edge of any convenient ocean. I wanted winter trips to places with palm trees and tall glasses full of things made with coconut milk. Like any normal American, I wanted an Italian Ice Cream Maker just as soon as the prices came down.

Now all I want is a switcher box to toggle between my two printers.

I don't remember that I ever used the word toggle before.

How could it have happened? Me, a computer nerd? Maybe it was the first time I used the term "user-friendly," and felt real smart. Or, the first time I heard somebody else use the term "user-friendly" and dismissed them as seriously behind.

I haven't bought a plastic sleeve to put in my shirt pocket to protect me from leaking pens yet. And I do not now own, nor have I ever owned, my own slide rule.

But I notice that when I'm in a room full of old friends, their eyes glaze when the subject of computers comes up. When I am in a room, the subject always comes up. So, I find myself less and less often in a room with my old friends.

Maybe it happened to me the first time I understood a nested for-next loop. Or, when I let my subscriptions to Better Homes and Gardens lapse in favor of one to Byte.

Maybe it was when I considered putting Jack Tramiel up for sainthood for uttering the immortal words, "Make it fast! Make it cheap! And make sure the damn thing hooks up to a TV set! Everybody's got a TV set!"

Or, it could have been the first time I got more excited about finding single sided, single density disks for under a dollar than I did about finding a Halston for under a hundred.

It must have happened very slowly. Just because I wanted to be the first kid on my block to have her own computer. Then, I thought I ought to read the manual to figure out how the little sucker worked. Then, I wanted to meet some other people who already knew how the little sucker worked, so they could tell me and I could stop reading any more of the manual.

And, before you could say "Machine Language Assembler Code", I was telling other people how the machine worked. Oh, nothing complicated, like what address in memory you should locate your program in so as not to interfere with the BASIC interpreter. Much simpler stuff. Like, "If you really *are* moving into the new house next door to Three Mile Island, you probably *DO* need a surge

protector." Or, "If the little red light on your disk drive is still on after you have washed the dog, both kids, and the kitchen floor, it is probably OK to pop the door and snatch out the disk. Or, what's left of it."

Now, nobody has actually used the term "geek" to my face yet. But a lot of supposedly normal people keep saying things to me like, "Oh, computers? Computers, huh? You're into that?"

Maybe I reached critical the day I refused to check into a hotel before I saw the room, to make sure the phone was modular. Modems require modulars.

Or, maybe it was when the phone man came to install the second phone line for data so I wouldn't be bumped off of PlayNET every time call-waiting kicked in on the primary line. Or, the fact that I even considered getting a second phone line for data at all.

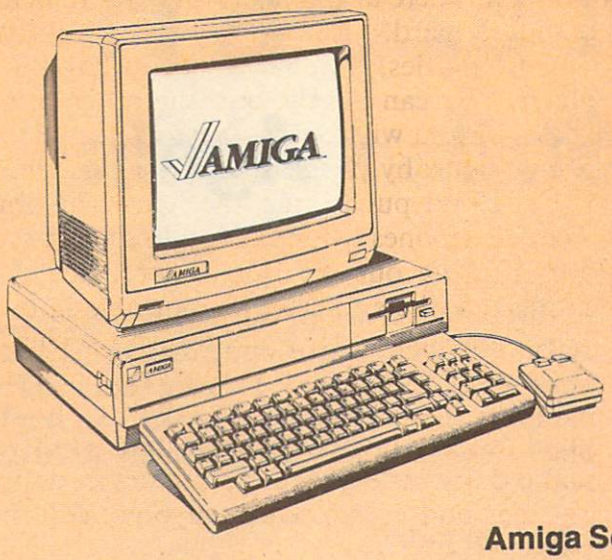
It could have been the day I stopped "turning off" appliances and started "powering them down" instead. Or, the first time I came home from the grocery store and "downloaded" the car.

Still, there are some advantages to being a computer nerd.

At parties, you never really have to be alone. You can always spot the other compulsives, so you will have someone to talk to and not get stuck by yourself in the corner, pouring the kool-aid punch into the ficus benjamina. They're the ones who beat you to the ficus, and are checking out the floor boards for three-pronged sockets to plug the portable into.

Computer nerd? I guess it isn't such a bad thing being one. And if enough people like me get to be them, maybe we could even give it a good name. Maybe we could even get them to make those little pocket protectors in designer patterns and colors. Does anybody still make paisleys?

But, I still draw the line at slide rules. What do you think I am?



AMIGA SPECIAL

$1995.00

- CPU w/68000 Processor
- Keyboard & Mouse
- 512K Memory
- Two 880K 3½" Disk Drives
- Amiga 1080 Color Monitor

Amiga Software	Retail	Our Price
Deluxe Paint	$ 79.95	$ 67.96
Textcraft	$ 99.95	$ 79.95
Amiga Pascal	$ 99.95	$ 79.95
Lattice C Compiler	$ 179.95	$ 143.96
Amiga Assembler	$ 99.95	$ 79.95
7 Cities of Gold	$ 39.95	$ 33.95
Archon	$ 39.95	$ 33.95
One on One	$ 39.95	$ 33.95
Hitchhikers Guide to the Galaxy	$ 39.95	$ 29.96
Mindshadow	$ 44.95	$ 33.71
Hacker	$ 44.95	$ 33.71

Commodore 64/128 Software	Retail	Our Price
Word Processors		
PaperClip w/Spellpak	$ 79.95	$ 59.96
Bank Street Writer	$ 49.95	$ 37.46
Superscript C-128	$ 79.95	$ 67.96
Spreadsheets		
Multiplan 128	$ 62.50	$ 46.88
Creative Calc	$ 49.95	$ 37.46
Integrated Programs		
Vizastar	$ 119.95	$ 89.00
Data Base Management		
Superbase	$ 79.95	$ 67.96
Superbase 128	$ 99.95	$ 84.96
Entertainment		
Ultima IV	$ 60.00	$ 45.00
Jet	$ 39.95	$ 29.96
Star Trek	$ 39.95	$ 29.96
Flight Simulator Scenery Disks	$ 19.95	$ 14.96
Newsroom	$ 49.95	$ 37.46
Newsroom Clip Art	$ 29.95	$ 22.46
Print Shop	$ 44.95	$ 32.95
Print Shop Graphics Library	$ 24.95	$ 18.71

Amiga Special Limited to Oregon & Southern Washington Customers Only

SOFTWARE CENTER

(503) 626–8696

Store Hours:
Mon-Fri 9–6
Saturday 10–6
Sunday 12–5

11386 S.W. Beav-Hills Hwy
Beaverton, OR 97005
(across from Beaverton
Fred Meyer)

The Atari 520 ST:
Uncle Jack Strikes Again

by Bob Richardson

When digital electronic computers first entered the general awareness, they were often identified with the brand name of the machines that first broke into the market. While IBM played catch-up, it was the UNIVAC that everyone talked about in much the same way that we "Xerox" things on Cannon photocopiers. Similarly, when computer games looked like they were about to undo Western civilization, people talked about playing with their "Atari's" even though the actual machine was made by another manufacturer.

Enter Commodore with a game/computer at just the time the buying public was becoming disenchanted with the pile of cartridges that so limited their "player" machines. The Vic 20, followed by the 64, became the stuff of legends, while Atari hemorrhaged red ink by the $100 millions. Atari built some good machines of its own (the 400, 800 and XL were the equal of anything on the market), but was never able to recapture past glory. Every time they tried to take a stand in the market, one Jack Tramiel at Commodore jerked the price floor out from under them. It is a tribute to Atari that they survived at all (Texas Instruments Home Products, for one, did not).

Over a year and a half ago, Jack Tramiel left Commodore to take over the remains of Atari. In the tradition of Lee Iacocca, Atari has been brought back to life and has introduced an entirely new product line. Tramiel and his new cohorts now hope to gain the market position that made Commodore so profitable. Tramiel's stratagy of producing the most machine for the least price is quite evident in Atari's newest product, the 520 ST.

System Configuration

The basic ($799) 520 ST includes a 68000-based computer with 512K memory, color graphics and basic sound synthesis. Attached through the back of the machine are a single 360K, 3½-inch microfloppy disk drive and an ultra-high resolution 13-inch monochrome monitor. For $200 more, you can replace black-and-white with a high quality RGB color monitor.

The Computer

The main unit contains a 16/32-bit 68000 microprocessor that runs at an 8MHz clock rate. By comparison, a Commodore 64 uses an 8-bit 6510 (6502 family), running at 1.1MHz. This means that an Atari will run at least eight times faster than a 64 with even higher increases when heavy math operations are needed. Recalculating a spreadsheet in one minute on a 64 would take around five seconds on the Atari.

Complementing the 68000 is a graphics co-processor chip that supports three distinct modes: A 320×200 pixel mode with 16 colors chosen from a palette of 512, 640×200 pixels in four colors, and 640×400 in black and white only. Also attached to the processor is a sound synthesizer with many of the same features as the 64's SID chip, but with a lower tone quality. Finally, a third co-processor, called the DMA (Direct Memory Access) unit, handles all input/output with microfloppys, hard disks, modems and printers.

The case includes a 95-key keyboard with ten function keys, a cursor pad with HELP and UNDO keys and a numeric section with all four math operators (+, −, *, /). On the right-hand side of the case, you will find two joystick ports (one accommodates the mouse included with the system), and on the back are a reset switch, a power switch, MIDI-in and MIDI-out ports (more about MIDI later), a monitor connector, a parallel printer port (IBM/Centronix standard), an RS-232 port, a disk drive connector, and a DMA hard disk port.

Peripherals

An Atari 520 ST can handle up to two microdisk drives, one hard disk, two printers, or a printer and one modem, and a MIDI device at the same time.

The disk drives are compact units about a quarter of the size of a 1541 and have external power supplies to prevent overheating. (In fact, I left my drive on for three days once, and it never even got lukewarm.)

Storage capacity for the standard system drive is 360K, and you may purchase either another 360K drive or a double-sided 720K drive. The double-sided drive is capable of handling single-sided disks, but the single drive cannot handle the double-sided disks. Transfer rates are up to a whopping 16K per second. Prices on the drives are $199 and $299 for single- and double-sided drives, respectively.

Coming Soon

Atari plans have a hard disk on the market by the time you read this. The expected disk will employ the DMA (direct memory access) chip to transfer data between memory and drive at very high rates of speed (without bothering the 68000 processor). Transfer rates for both the floppy drives and hard disk will, by comparison, make a Macintosh look like it is stopping to play solitaire during load operations.

Also announced is a Laser Disk reader that can access 550 million bytes on a single, removable optical disk. These disks cannot be written to, but that is not how the drive is currently being used. Atari has been demonstrating a disk with an encyclopedia stored on it that could be searched end-to-end for any topic or phrase in only three seconds. The data for this encyclopedia fills only a sixth of the disk. Prices are not yet firm, but are expected to be around $300 for the disk reader and $200 for the encyclopedia software.

Just about any printer ever made can be connected to the standard printer port on the back of the computer, including the new laser

Shown here is the basic 520 ST with disk drive, mouse and monitor.

and color printers. The 520 supports Epson protocol. The RS-232 port can handle a variety of serial printers or most standard modems.

Finally, there is MIDI (Musical Instrument Digital Interface) port. MIDI has been used in recent years to link full-featured music synthesizers, drum machines, and sequencers together. The MIDI system allows you to compose music on the computer and hear it played through many different instruments simultaneously. The MIDI port can also be used to link many Ataris together for a multi-user network.

Operating System

The Atari includes the GEM operating environment which allows multiple screen windows, different text styles, and mouse operation. GEM is a graphics/mouse oriented operating system, much like that most often seen on Apple's Macintosh. GEM is a Digital Research Incorporated product (creators of CP/M), and Apple has been to court to force DRI to make cosmetic changes in GEM.

Atari has licensed several other operating systems, which they plan to bundle as options for the 520. Deals have been made that include BOS (Business Operating Systems) which is a popular multi-tasking mainframe system in Europe and AT&T's UNIX which is widely used among hackers and business users stateside. It appears that AT&T will even be selling a specially-modified version of the 520 as a low-end Unix terminal.

Software

Built into GEM are several programs that you may use at any time during the operation of another program. These include a calculator, a Breakout game, a terminal program, and a control panel to customize the look of your system. Atari also includes in the package a powerful version of BASIC with many graphics and text handling extentions and one of the fastest versions of Logo ever produced. When you send in a registration card, Atari ships out a more advanced terminal package, a high-powered word processor with features similar to **PaperClip**, and a painting program with many advanced features.

#Software from other developers is appearing quickly for such a new computer. At last count, there were 30 packages on the local dealer's shelves and over 100 more are reported to be in final testing. Atari says that in excess of 700 software development systems have been sold to other companies.

Complaints

I don't care much for the touch of the keyboard. It feels too "springy", and it's not crisp enough. Then again, I've never really appreciated any computer keyboard, and I know other people that just LOVE this kind of feel.

Another complaint I have is how long it takes Atari to get anything done: As it stands, you must load the 206K GEM system from disk when you turn the computer on. This half minute wait is not as bad as it might be, since the 520 ST allows you to exit most programs without resetting the system, but Atari promised that GEM would be available on ROM (for a "nominal" fee). I have been waiting, with four empty chip sockets, for six months now.

We hope that Atari will fix some minor bugs in GEM before shipping the ROMs. For example, if you try to open the window of a bad disk, the computer will tell you that the drive is not responding and asks if you'd like to retry the disk or cancel the operation. Insert a good disk, retry and all will be well, but if you cancel, the system locks up. When this happens, you are back to reloading GEM from scratch.

Another complaint I have heard is that you can use the highest resolution display only with the monochrome monitor. Also, even if you are willing to buy two monitors, you will have to shut down and re-boot the system to change from one to the other. Also note that there are no sprites, but the machine offers other facilities in their stead, and is so fast that you may never miss the sprites.

Conclusion

Atari has put a powerful processor together with fast support I/O chips and high quality video. A number of development languages (important to the continued supply of new software) are already available for the machine, and the wide range of standard ports enhance its expandability. All in all, the Atari 520 ST is shaping up as interesting and a remarkable value.

■

Atari Bundled Software:

Up And Running For Free

by Bob Richardson

The Atari 520 ST comes bundled with several programs to get you up and running. These programs cover word processing, database management, and business graphics, all in one package, which you get with the purchase of your system. These programs are as follows:

ST-Writer — a basic word processor like **PaperClip**.
1st Word — a more powerful word processor featuring multiple windows.
DB Master — an easy-to-use data base manager.
NeoChrome — an advanced graphics package with animation support.
VT-52 Emulator — a simple terminal program.
Megaroids — A new take-off on the arcade classic, **Asteroids**.

All of these programs may either be copied from a master disk at an Atari dealer, or you will receive them on several disks in the mail by sending in your registration card to Atari.

Before we review the individual products, let me remind you that these programs come *free* with the system, so my criticisms may not be valid, considering the price!

ST-Writer

This word processor is the 520-ST's version of the popular Atari Writer program available on the older machines. This program supports many features, including **boldface**, *italics*, superscripts, and subscripts. Unfortunately, you cannot see how your text will appear before you put it on paper.

The program begins with a menu of options that allows you to perform most disk functions, print a file, and edit a file. On the high-resolution monochrome monitor, you can also edit text in a 50-line by 80-column format instead of the usual 25×80. There is even an option for transferring an older Atari **Writer** file over to the 520 with a simple cable.

Editing text is simple — just move around with the cursor keys and enter changes. Holding down SHIFT with the cursor keys allows you to move quickly through large files. Most functions such as *cut and paste* are accessible through the use of function keys. In an unexpanded 520 ST, there are about 150,000 bytes of storage for your document. This amount is expected to double when (and if) the GEM ROMs are available. If you have a 512K expansion in your ST, then **ST-Writer** supports the additional memory.

Print formatting commands are numerous and are embedded in your documents in a manner similar to **Easy Script** or **PaperClip**. These commands allow you to change such parameters as margins, line spacing, page size, text style, centering, margin justifications, and other items.

Two basic types of printers are supported: Standard Epson compatible models and Diablo standard daisy wheels. Other printers may be added with an optional configuration program. Output appears as monospaced on dot matrix printers, but becomes proportionally spaced when you use a daisy wheel.

Unfortunately, **ST-Writer** files cannot be loaded into most other word processors; however, you can output a file to disk as it would go to the printer and then edit out the unnecessary characters in the new editor. Another minor complaint is that you may only work on one document at a time. It is next to impossible to remove text from one file and paste it into another.

These qualms aside, **ST-Writer** is a great program at a bargain price, and allows you to

write quick memos or small novels with equal ease and formatting capability.

1st Word

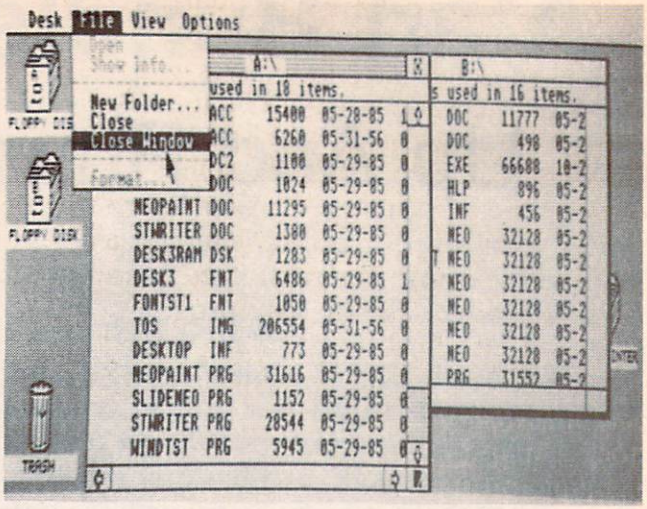
This word processor allows all the same features as **ST-Writer**, but adds a beautiful on-screen rendition of how your text will appear, including *all the special text styles* and justification. Text editing is as simple as ever; just use the cursor keys and mouse for all functions. If you are the kind of user who dislikes the mouse concept, then you may use the function keys to access most program options. A pictorial representation of all the function keys appears at the bottom of the screen (usually placed directly above the actual keys on your computer).

A nice feature of **1st Word**'s window display is an additional window that may be viewed at any time. This window contains all the foreign language characters (Spanish, French, German, Greek, and *Hebrew*) and graphics characters. Using the mouse, you may copy these characters directly into your document; and all supported characters will appear on your printer.

Margins and tab stops are adjusted by clicking the mouse on a "ruler" that appears at the top of your document. Along the left side of the window is a gauge that shows the number of the page you are currently editing. To cause a forced page break, just click your mouse on the portion of the window displaying the point where you want your break to occur. To cut and paste documents, you may either use the mouse to "draw" a box around the text to be used, or you may use control characters. The text is automatically highlighted. The text block may then be cut, copied, deleted, or pasted.

One of the nicest features of **1st Word** is that you may edit more than one document at a time and copy text between them. This is achieved using multiple windows. On the monochrome monitor, the effect is breathtaking. You can see both changes caused by deleting and copying text *immediately*.

By far, the best feature of **1st Word** is the way it saves a file. If there is an old copy of the file on the disk, instead of erasing it, **1st Word** makes a *back-up copy* of the file before saving the new revision. This prevents the user from



Overlapping windows and mouse-driven, drop-down menus of GEM environment.

accidentally overwriting an old file with a completely different file. This fine feature has already saved me more than once.

Printer support for **1st Word** is outstanding. If your printer is not one included in the built-in modules, you may create a file by simply editing the ASCII printer module. The modules are fully explained by built-in text, and you need only to copy the special characters found in the back of your printer manual.

Surprisingly, I have *no complaints* about **1st Word**. It is a full-featured processor, and has a price that most people should agree with (free). If this is an example of what comes at no charge with the 520 ST, then I can't wait to see the software that costs money!

DB Master

This program is by far the easiest to use data base management program "on the market." It allows you to create just about any file format to keep track of information.

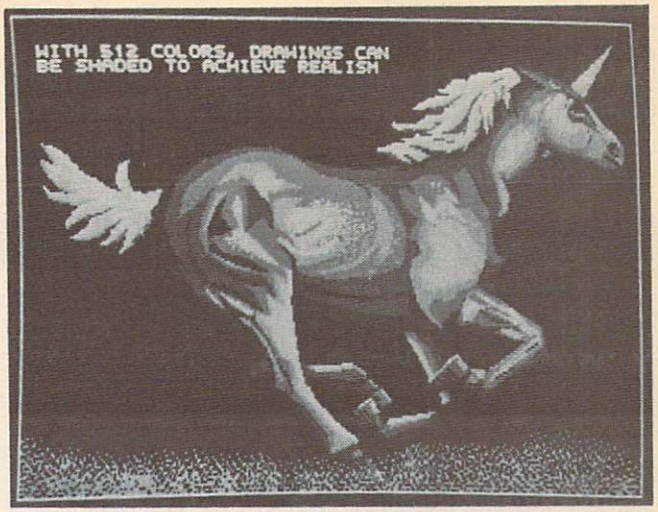
To create such a file (called a *template* is simple: just move the mouse to where you would like the "Name" line to be and click the button. Type in the word "Name" and press RETURN. You may then use the mouse to adjust the size of the line (called a *field*), and you are done. Now do the same thing for the rest of the fields, and save the file when satisfied. You may also move fields around and delete them as you please.

Now you are ready to enter data. Just type in the required information and press return. **DB Master** automatically moves the cursor around for you and stores the data when you are done. Most databases will store the information in chunks on the disk. On a 520 ST, however, there is usually just as much room in memory as there is on a disk (sometimes even more), so the whole works is stored in memory along with the **DB Master** program. This allows you to find and update information quickly, as well as sort the information in the order you choose.

My only complaint: There is no "program" mode with which to write programs to control the data base. Such modes are included in several Commodore databases (**Superbase**, for example). Again, the "gratis status" renders my complaint minor.

NeoChrome

This graphics package is a **Koala Pad**-like drawing program with features such as multiple type fonts, a choice of 16 colors from a palette of 512, cut and paste, and rudimentary animation capabilities.



Example of SC1224 color monitor output.

All drawing is performed with the mouse in the top half of the screen. The bottom half shows *icons* of all supported functions, and the complete 512-color palette. Pressing the ESCape key allows you to switch between full and half-screen displays. An icon called "the hand" allows you to view any section of the screen in the half-view mode. Most basic drawing functions are supported, except for the

absence of *circle* and *box* drawing routines. These functions are expected to appear at Atari retail outlets in a future version.

Animation is achieved by a function known as "cycle colors." This allows you to select a range of colors and have them *scroll* from left to right (or right to left) at a wide range of speeds. The effect, coupled with the right painting, can be quite impressive. One of the pictures included is of a waterfall that comes to life when cycle colors are invoked.

At first, I was shocked to find that Atari did not include the circle and box functions, but then I came to realize what a great marketing move this is: Hook the users on the free program and they will gladly purchase the advanced version when it becomes available.

VT-52 Emulator

This terminal program is literally included in the 520 ST system. What I mean is, from just about any program, like **1st Word** or **DB Master**, the **VT-52 Emulator** is accessible through the system menu. This allows you to pick up E-Mail, to contact information services for answers to questions, or to gather data for a report and then return to the original program.

Megaroids

This is a true rendition of the arcade classic, **Asteroids**. It includes *everything* found on the original. Controls are operated from the keyboard in the same layout as is found in the arcade version.

This is *not* a complaint: When using the "hyperspace" option, there is no longer a risk of self-destruction. Nice going, Atari!

The program is really an advertisment for a new C Language compiler from MegaMax, Inc., showing what can be done with their language. They will provide you with a printout of the actual source program for $25.

In Closing

I would like to compliment Atari on the fine job of supplying new users with a more than adequate selection of software. There are very few computers that will allow one to set up the system and begin word processing, painting, or record keeping right away.

Computer Curmudgeon

BBS Content: Who's Responsible?

" . . . What's your reaction to a BBS in Canada that bills itself as a "terrorist" BBS? . . . "

by Mindy Skelton

Let me warn you in advance. There's no humor this time. I'm just as curmudgeoney (is that a word?) as ever, but, for now, I want to talk about something serious. A few days ago, a friend showed me something that disturbed me greatly. It was an article (that he had downloaded from Compu-Serve) about pending national and state legislation that would, among other things, make sysops criminally liable for everything posted on his/her board, whether or not the sysop knew it was there. *Criminally liable* . . . Wow! How did we ever get to a place like this? How did things get so out of hand that our national and state legislators, most of whom wouldn't know a modem from a toaster, have become concerned enough to consider formal regulation of BBS's?

Well, let me give you a clue. It wasn't because they thought we were playing chess online too much. No, the precipitating cause was a pederast's BBS which listed names and addresses and had a library of digitized pictures of available children. Things seem to be getting out of hand. Maybe it's time we looked at what's going on while we still have a chance to influence the decision-making process.

My first draft of this article sounded like it was written by Patricia Henry (Patrick's little known younger sister) with shouts of "Give me liberty or give me death!" and great soapbox oratory about freedom of speech and the press. Time for reflection and several knock-down, drag-out fights with more level-headed friends have convinced me that I might want to come at this from another direction. Just how much freedom can we rightfully expect on our BBS systems? Is freedom of speech even an issue here?

Just what is a BBS? Is it an electronic newspaper? Is it a mail box, a singles bar, a notice board, a software store? It's none of these and all of these. It's something new in the world of communication, and, as such, has no hard-and-fast rules governing its set up. That is both a gift and a problem. It means we have no guidelines, but have the opportunity to develop them — if we act before guidelines are set for us.

In many ways, I feel we must take responsibility for the current situation. We've let things go unstructured for too long. How many of us have closed our eyes or smiled knowingly at copyrighted information being passed over a BBS? How many of us would

have the same reaction to a BBS that posted information on how to build an atom bomb, or posted a list of killers for hire? What's your reaction to a BBS in Canada which bills itself as a "terrorist" BBS and offers information on how to build bombs, and hijack airplanes? Not quite so amused?

And what about obscenity on-line? Where do you draw the line? Is it obscene to send someone X-rated E-mail? Is it obscene to go off to a private room on one of the networks to engage in "compu-sex"? How about a Network devoted solely to sexual matters? How about a sexually explicit message on the notice board of a public BBS? Which, if any, of these gets your vote, and what would you do about it?

This brings us to one of the touchiest areas; how public or private is a BBS? It's easy to think of a BBS as a very private thing. After all, it's just you and your computer and some disembodied presence on the other end. In many cases, the presence on the other end is just a "handle" . . . no real name. In any case, unless you know the person in real life, you're taking it all on faith.

While thinking about this, remember: proposals exist to eliminate "handles". Horror stories abound of people who represent themselves as significantly different from their real selves, to the detriment and embarassment of others. What could be more ephemeral and private than an on-line message? It exists nowhere. It's merely a collection of electronic pulses designed for your eyes alone. Unless you save it to a disk or printer, it ceases to exist as soon as you finish reading. What other form of communication can make that claim (outside of Mission Impossible)? Yet this private, even intimate form of communication is actually a child of a very public and highly regulated utility, the telephone system (formerly Ma Bell). With a very few exceptions (say, a radio show that transmits signals to you over yet another public medium), all telecommunication happens over the phone lines, and this use of the public ether opens the BBS to regulation.

Now because the BBS system does use the phone lines, some special situations arise. If an obscene phone call is made, the phone company is not held liable, but if obscenity is transmitted over a BBS, the operator *is* held liable. Why is that? Is it just because the phone company is a multi-national conglomerate and had attornies to pull strings, or is it because sysops are in a unique position? The phone company has records of what calls were placed from what numbers, but (at least theoretically) has no record of the CONTENT of the calls, and can exercise little if any control over what is said. A sysop not only knows who placed the calls, but can review and edit the content of any messages left for the general public, and in some cases, even can access private messages. [There are certain

exceptions to the foregoing, which will be mentioned later.]

It is this control over the boards that leaves sysops open to charges of, at least, carelessness when users post obscene messages, or pirated material, or someone else's credit card number. This control is also highlighted in proposals to have sysops keep logs of all users who contact the boards, and the time and content of the contact.

How culpable are sysops in reality? Most of our local BBS's are run by people who have other things going on in their lives besides the BBS. They're kids going to school, or dedicated computerists who run their BBS out of love. This is not their full-time job, and because they *do* have other things to do, they may not screen every message that comes on right away. It may be there a couple of days before the sysop is aware of it, especially if it is on a very busy board, which logs hundreds of calls per day.

Should the sysop be held responsible for something of which he or she is not aware? Would a supermarket manager have his supermarket closed because someone posted an illegal notice on his board? Probably not. But, in California, a board was closed down and all the sysop's equipment confiscated because credit card numbers were posted for people to use.

Remember earlier I said there might be circumstances in which a sysop would not know who had logged on or what the content of a message was? Well, let's face it ... there are folks out there who get their jollies out of breaking into, crashing and otherwise disturbing boards. Someone like that could easily break into a board and leave any message they liked without the sysop being aware. This needs to be taken into consideration when writing legislation. People who are willing to threaten to blow up the sysop's home and/or do physical damage to the sysop and his family because the sysop wouldn't make the changes they wanted in his board, all of which involved publishing pirated information (as happened to a no longer operating local board), are not likely to restrain themselves because the sysop might suffer. I know this is an extreme example, and is representative only of a tiny minority of the population, but the possiblity has to be taken into consideration when legislation is being considered.

It is for reasons just like this that we need to get involved in the debate. If we don't make legislators aware of all the possibilities, if we don't make it possible for sysops and users to have input into the legislative process, we have little chance of having legislation enacted that would be fair to sysops. At the very least, we need to suggest giving sysops a chance to remove messages before criminal charges are brought.

What we need to do is to get our legislators to slow down for a moment. They need to talk to responsible members of the telecommunication community. We're not necessarily saying that there should be no legislation, but to be acceptable, to be equitable to all sides, legislation has to be worked out by informed people, and with the cooperation of all concerned.

Find out if there is legislation pending in your state. If there is, write your representatives and urge them to establish contact with sysop organizations (which should be established if they don't already exist in your area). If we all work together on this, we can maintain telecommunications for everyone, and if we don't we'll suffer on every level from the smallest local BBS to the largest national network.

THE DISK BANK

2700 N.E. Andresen Rd.
Vancouver, WA 98661
(206) 695–1018

Premium Bulk Diskettes

Black 56¢ ea.

- Lifetime Warranty
- Reinforced Hubs
- With Sleeves

SS/DD

Red — Gray
Green — Blue
Maroon

Colored 79¢ ea.

Quantity of 500 Less than 500...63¢ ea.

ACCESSORIES

Disk Notcher.....$6.99
Disk Labels 100 ct.....$3.49
100 Write Protects.....$1.59
Storage Box Holds 100.....$15.99
C-128 RGB Conn.....$9.95
C-64 Power Supply.....$39.95
4-Slot Expansion Board.....$29.95
Mach 5.....$22.95
Fast Load.....$29.95

PRINTERS

Panasonic 1091.....$269.99
Panasonic 1092.....$369.99
Gemini SG-10.....$249.99

COLORED RIBBONS

Blue – Green – Red

Panasonic.....$10.99
Star Gemini.....$3.29

INTERFACES

MW-350 Graphic.....$79.99
P.P.I. Interface.....$39.99

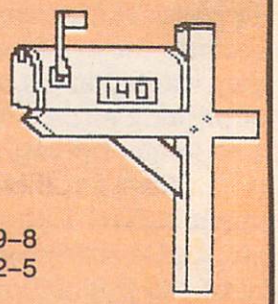
SOFTWARE SELECTION

Newsroom.....$39.99
Clip Art Disk.....$27.99
Printmaster.....$32.99
Print Shop.....$36.99
P.S. Graphics Library #1, 2, or 3.....$18.99
Superbase 128.....$79.99
Superscript 128.....$59.99

We Carry All Of The Latest Software Titles

C.O.D. Same Day Service

VISA
MasterCard



Open 7 Days a Week:

Mon–Sat.....9–8
Sunday.....12–5

COMPUTER MART

2700 N.E. Andresen Rd.
Vancouver, WA 98661
(206) 695–1005

Open 7 Days a Week:
Mon–Sat.....9–8
Sunday.....12–5

Snapshot Disk Copier	$49.99
Fast Hack'em Parameters	$6.00
Disk Drive Cleaning Kit	$6.99
Disk Drive Fan	$34.95
Disk Bank 5 (Holds 50)	$10.99
Printer Stands	$13.95
Book of Adventure Games	$19.99
Colored Printer Paper..... Up To	$22.99
Hes Mon	$24.99
Commodore 128 Internals by Abacus	$19.95
Commodore 128 Tips & Tricks	$19.95
Commodore 128 Dust Cover	$7.99
Commodore 1571 Drive Cover	$8.99
Panasonic 1091 Dust Cover	$8.99
C-64 Dust Cover	$7.99
1541 Dust Cover	$7.99

Six-Outlet Surge Protector

$19.99

Commodore 64 and 128 SOFTWARE PREVIEW

- $4.00 for 3 days.
- No Deposit Required
- Choose from over 1000 titles
- Available Locally Only!

Shop Our Magazine & Book Section

- Transactor
- TPUG
- Run
- Gazette
- Ahoy
- Compute
- Info-64
- The Guide

Plus More!

Ribbons Available

For Most Printers

Star SG 10.....ea. $1.99

Amiga Software

Now In Stock

3½" Hard Disk DS/DD.....$1.99 ea.

Commodore 64 Repair

UP TO $54.95

- 30-Day Warranty

1541 Drive Alignment

$39.95

Choose from HUNDREDS of products for the

Commodore 64 & 128

LOW DISCOUNT PRICES

Mail Order Available

VISA COD MasterCard

Same Day Service

The Bud Izzit Art School

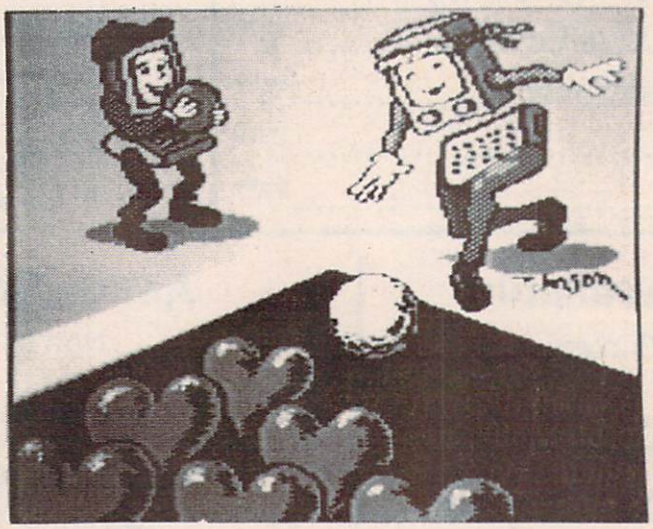
Just Like A Rolling Stone

by Eddie Johnson

[Editor's Note:

Mr. Izzit is again unavailable to write this column this month. He has decided the only way to get his "One Percent for Art" bill attached to NASA's budget is for him to introduce it himself, so he is busy planning his campaign to get himself elected to Congress. He is, naturally, unwavering in his ultimate ambition to become the first artist in space.]

I don't know about you, but I don't feel very comfortable with most computer games; they either have me slaughtering hordes of aliens, shooting up swarms of bad guys, or fighting in some past or future war, and I'm sick of all the bloodshed! However, action/strategy games can be a lot of fun to play, and even more fun to write. So, for this, the Valentine issue of *The Guide*, I have written a little arcade game that makes Love, not War!



Most good games have a scenario, and **Rolling Stone** is no exception. You are a notorious heartbreaker; it seems that you add to your long string of amorous conquests everywhere you go. But, *beware!* Some of those poor lovesick wretches have matrimony on their minds, and if you should happen to run into one of them while you're carousing around, that will be the end of your philandering! Even if you avoid this ending, the fun finally ends after a certain number of trips (eleven on the VIC-20, and twenty on the C-64), so organize your itinerary to win the hearts of as many admirers as possible.

When you run the game, you will see a black playfield surrounded by a white border with a tally board on the top line of the screen. The playfield will be sprinkled with multicolored hearts (your potential spouses). The blinking disk is you, the "rolling stone". The row of "stones" at the top right of the screen tells you how many trips you have left.

The object of the game is to collect as many hearts as you can before you either run out of turns, or run into a hasty marriage. The different colors of the hearts represent different point values: Red = five, Cyan = ten, Purple = fifteen, Green = twenty, and Blue = twenty-five. The wedding rings are worth thirty points, but you can collect only one of those, of course.

Playing the game requires two operations: first, you must move the stone to a strategic location (unless you happen to already be in a good spot). To do this, you use the U, I, O, J, K, N, M, and comma (,) keys as your eight directional cursor control keys. It will cost you

a point for every move you make, so plan your moves carefully. When you are in position, press [RETURN]. Then, using the same cursor keys, you aim and "roll" the stone. It will continue in a straight line in the direcion you aimed until it hits the border (unless it runs into one of the rings). Any hearts collected along the way will be added to your "string." Since the rings count thirty points, it is often a good tactic to aim for a ring at the end of your last trip.

In **Rolling Stone**, we have broken the tasks the computer must perform into a series of short modules and subroutines to make the structure of the program easier to understand. This also should make it easier to modify and de-bug.

The module in lines 100–200 initializes our variables and sets up the playing field on the screen. Line 100 uses a DEFined FuNction for a RaNDom number variable. MV$ is our cursor control key string, and K is the right end position of the "turns left" Kounter on the screen memory map. RN RaNdomizes the random number generator by seeding it with the current value of the "jiffy" TImer; this ensures that the game will be different every time you run it. CL is the offset between the screen and color memory maps.

Line 110 READs the DATA in line 570 and puts it into an array. These numbers will be used to move the "stone" in the direction selected by MV$ (if you change the keys in MV$, make sure they agree with these numbers). When we add (or sutract) these numbers from the stone's current position, it will move in one of eight directions.

Lines 130–170 use the subroutine at 330 to make straight lines using different characters (and on the C-64, different colors) to draw the turn counter and the frame around the playfield.

Lines 180–200 use the subroutine at 340 to randomly place the hearts, rings, and stone on the screen.

In lines 210–320, we find the main program simpler to write, as well as easier to understand (and it saves memory, too!) These are some of the benefits of a structured programming style.

Line 210 sets the Direction of the Stone to zero; this, oddly enough, prevents you from using anything but the cursor keys in MV$ to move the stone. 220 sends you to the "roll loop" if you press [RETURN] and changes either the color (C-64) or the shape (VIC-20) of the stone. Both action loops jump to the subroutine at 430 to check the color of the space to which you're about to move (more on this later). If it's not empty (i.e. black), line 240 sends you back for another try. Line 250 subtracts a point for every move and displays your new score. Again, both loops go to the same subroutine (at line 440) to actually move the stone.

In line 270, we again prevent you from using unauthorized keys to roll your stone (IF DS = 0 THEN try again). If our stone is about to run into something besides a blank space (line 290), then we jump to line 460 to increment our score and see if we have blundered into a wedding ring. If the space is white (line 300), we have hit the border, and we go to the routine at 490 to update the scoreboard. Finally, in line 310, we can use the subroutine at 440 to move the stone. *Whew!*

The rest of the program is pretty much self-explanatory, but there are a few more little tricks I would like to point out. If you've never used a defined function variable before, look how useful it can be: in line 350, it is used to find random colors from red through blue (2–6) for the hearts. It is also used to specify single colors for the rings and the stone (see lines 180–200).

Study line 400 to see how we transform a key press into a direcion for the stone to move, and look how the formula in line 460 uses the heart color to calculate the score.

Line 430 was a major reason for writing this program; it shows the use of "AND" as a Boolean arithmetic operator to do bit manipulation. "Huh?" Confused? So was I, at first . . . let me confuse you further before explaining what all that jargon means.

Type in the **Handy AND** program and RUN it. It will first POKE a white square into the upper left-hand corner of the screen. Then, it will PEEK the color of that square, first without the "AND", and then with it. It will do this twenty times, printing the values to the screen in two columns.

The second column (*with* the "AND") will be all one's, but just look at that mess in the first column! What happened? You only

POKEd a one into that location! Where did those other numbers come from? Well, they came from the top nybble of the byte found in that color memory map location, added to the bottom nybble that we POKEd in there, and it is only the bottom nybble that we want to know about. And now, we have to talk about binary numerals.

When we think about numbers, we generally think in terms of decimal numerals (the ten numerals 0–9); we *do* have ten fingers, after all. In the binary numbering system, we use only two numerals: 0 and 1, which we usually refer to as "bits" (we would call them "digits" in decimal — "bit" is short for BInary digiT). A byte is eight bits and a nybble is four bits (two bits is twenty-five cents).

Binary (or base two) numerals, like decimal (base ten) numerals, are written in "positional notation"; that is, the value of each bit (or digit) is dependent on its position (or column) in a multi-digit numeral. If we say that B = the Base number, C = the Column number (numbering from the right starting with zero), and N = the Numeral in column C, then we can say that the Value (V) of a numeral in a given column can be represented by the equation:

```
V(C)"="N*B[UP ARROW]C
```

To find the value of a multi-digit numeral, we add all the V(C)'s together.

Are we lost yet? Let me drop some bread crumbs. You will remember from your grade school arithmetic how each column in the decimal numbering system is ten times the column to the right of it. For instance:

1 = one (1*10[UP ARROW]0)
10 = ten (1*10[UP ARROW]1)
100 = one hundred (1*10[UPARROW]2)
1000 = one thousand (1*10[UPARROW]3)

and so forth. The zeros are used as "place holders". Remember that the first column on the right is the "zeroth" column. Of course, the decimal system uses ten numerals, so we can also have numbers such as:

9 = nine (9*10[UP ARROW]0)
90 = ninety (9*10[UP ARROW]1)
900 = nine hundred (9*10[UPARROW]2)

and so on.

Since in binary we have only 1's and 0's, the numerals from the first example would read:

1 = one (1*2[UP ARROW]0)
10 = two (1*2[UP ARROW]1)
100 = four (1*2[UP ARROW]2)
1000 = eight (1*2[UPARROW]3)

etc. Did you notice that each number is two times the number before it rather than ten times as in decimal? That means that the binary numeral 1111 is equal to the number fifteen (8+4+2+1=15); therefore, a four bit nybble can represent all sixteen colors (0–15) on a Commodore 64. The VIC uses the bottom three bits for the eight colors 0–7, and the fourth bit (in the "eights" column) for switching on those weird multi-colored characters that are unique to that machine.

Oh, yes, about that "AND" we're supposed to be explaining. If you take those strange numbers you got from the left-hand column of **Handy AND** and translat them into binary, you will see that in every case, the bottom nybble of the byte is always 0001, the number we POKEd into that location. That means that strange things are happening in the top nybble (don't ask me what), and if we could just ignore it, everything would be fine and we could determine the color of any location on the screen. This is a job for SuperAND!

Line 430 in **Rolling Stone** sets the variable TC equal to the number it finds in the color memory address represented by the Stone Position (SP) plus the CoLor offset (CL = the difference between the color memory map and the screen memory map) plus the Direcion of the Stone (DS). In other words, it is looking at the space you told it to move into to see what color it is and calling that Target Color TC. Without the "AND", this number could be greater than the possible number of colors, which would wreak havoc in the program.

How does the "AND 15" solve the problem of the "renegade nybble"? We are using it here to turn off (set to zero) the four bits in the upper nybble by comparing the whole byte (SP + CL + DS) to the binary numeral 00001111 (fifteen, remember?) and assigning the result to the variable TC. The comparison

is done bit by bit; if corresponding bits (in the same column) of the two numbers are both ones, then the corresponding bit in the number TC will also be a one. If either or both bits are zeros, then the same bit in TC will be a zero as well. Since the top nybble in the binary numeral 00001111 is all zeros, it means the top nybble in TC will also always be all zeros. Therefore, TC will always be anumber from zero to fifteen. Any 0 bits in the bottom nybble of the square we're PEEKing at will cancel out the corresponding 1's in 00001111 so that TC will be equal to the color that was POKEd into that square.

Got all that? If not, don't fear, we will be returning to the subjects of binary numbers and bit manipulation in the near future, and we will meet AND's cousins, OR and NOT. In the meantime . . .

Challenge Number Four

Find some other uses for some of the programming tricks in **Rolling Stone**. Or how about improving on the game itself? Sound effects? A fancy title screen? Make it more difficult? Be creative! We would like to see what you come up with, and we will publish the best submissions in the Izzit Art Gallery.

■

Rolling Stone Listing

For the Commodore 64

by Eddie Johnson

```
0 rem @@@@@@@@@@@@@@@@@@@@@@@@@
1 rem @@     rolling stone     @@
2 rem @@     commodore  64     @@
3 rem @@     eddie johnson     @@
4 rem @@     october  1985     @@
5 rem @@@@@@@@@@@@@@@@@@@@@@@@@
6 rem 2928 tennessee ne, albuquerque,
 nm 87110;  505) 299-1662
100 deffnr(n)=int(rnd(1)*n):mv$="uioj
knm,":k=1063:rn=rnd(-ti)
110 forr=1to8:readd:mv(r)=d:next
120 cl=54272:poke53281,0:print"[clr][
grn]turns left:",
130 a=1044:b=1063:c=1:ob=81:co=15:gos
ub330
140 a=1064:b=1103:ob=160:co=1:gosub33
0
150 a=1143:b=2023:c=40:gosub330
160 a=2022:b=1984:c=-1:gosub330
170 a=1944:b=1104:c=-40:gosub330
180 a=100:n=877:n2=1105:tg=83:n3=5:n4
=2:gosub340:rem hearts
190 a=13:tg=87:n3=1:n4=7:gosub340:rem
 rings
200 a=1:tg=81:n4=15:gosub340:sp=tp:re
m stone
209 rem ----- position stone -----
210 ds=0:gosub380
220 ifm$=chr$(13)thenpokesp+cl,11:got
o270
230 gosub430
240 iftc<>0then210
250 sc=sc-1:gosub500:co=15:gosub440
260 goto210
269 rem ----- roll stone -----
270 gosub380:ifds=0then270
280 gosub430
290 iftc<>0thengosub460
300 iftc=1thengosub490:goto210
310 co=11:gosub440
320 goto280
329 rem =====   =====
330 forf=atobstepc:pokef,ob:pokef+cl,
co:next:return
339 rem ===== random screen pokes ===
==
340 forp=1toa
350 tp=fnr(n)+n2:ifpeek(tp)<>32then35
0
360 poketp,tg:poketp+cl,fnr(n3)+n4
370 nextp:return
379 rem =====  press =====
380 getm$:pokesp,32:pokesp,81:ifm$=""
then380
390 form=1to8
400 ifm$=mid$(mv$,m,1)thends=mv(m)
410 nextm
420 return
429 rem ===== what color? =====
430 tc=peek(sp+cl+ds)and15:return
439 rem =====  stone =====
440 pokesp+cl,0:sp=sp+ds
450 pokesp,81:pokesp+cl,co:return
459 rem ===== score board =====
460 sc=sc+5*(tc-1)
470 iftc=7thengosub490:goto530:rem if
 yellow (ring)
480 return
490 pokesp+cl,15:pokek+cl,0
500 print"[home]your score:"sc,
510 k=k-1:ifk<1044then530
520 return
529 rem ----- end game -----
530 print"play again (y or n)?"
540 geta$
550 ifa$="y"thenrun
560 ifa$<>"n"then540
570 data-41,-40,-39,-1,1,39,40,41
```

Rolling Stone Listing

For the VIC-20

by Eddie Johnson

```
0 rem @@@@@@@@@@@@@@@@@@@@@@@@
1 rem @@     rolling stone     @@
2 rem @@  unexpanded vic 20   @@
3 rem @@     eddie johnson     @@
4 rem @@     october  1985     @@
5 rem @@@@@@@@@@@@@@@@@@@@@@@@
6 rem 2928 tennessee ne, albuquerque,
 nm 87110;  505) 299-1662
100 print"[clr]":deffnr(n)=int(rnd(1)
*n):mv$="uiojknm,":k=7701:rn=rnd(-ti)
110 forr=1to8:readmv(r):next
120 cl=30720:poke36879,14:forp=38445t
o38882:pokep,0:next:print"[home][grn]
turns left:",
130 a=7691:b=7701:c=1:ob=81:gosub330
140 a=7702:b=7723:ob=160:gosub330
150 a=7745:b=8185:c=22:gosub330
160 a=8184:b=8164:c=-1:gosub330
170 a=8142:b=7724:c=-22:gosub330
180 a=50:n=437:n2=7725:tg=83:n3=5:n4=
2:gosub340:rem hearts
190 a=7:tg=87:n3=1:n4=7:gosub340:rem
rings
200 a=1:tg=81:n4=1:gosub340:sp=tp:ob=
81:rem stone
209 rem ----- position stone -----
210 ds=0:gosub380
220 ifm$=chr$(13)thenob=87:goto270
230 gosub430
240 iftc<>0then210
250 sc=sc-1:gosub500:gosub440
260 goto210
269 rem ----- roll stone -----
270 gosub380:ifds=0then270
280 gosub430
290 iftc<>0thengosub460
300 iftc=1thengosub490:gosub510:goto2
10
310 gosub440
320 goto280
329 rem ===== draw line =====
330 forf=atobstepc:pokef,ob:pokef+cl,
1:next:return
339 rem ===== random screen pokes ===
==
340 forp=1toa
350 tp=fnr(n)+n2:ifpeek(tp)<>32then35
0
360 poketp,tg:poketp+cl,fnr(n3)+n4
370 nextp:return
379 rem ===== key press =====
380 getm$:pokesp,32:pokesp,ob:ifm$=""
then380
390 form=1to8
400 ifm$=mid$(mv$,m,1)thends=mv(m)
410 nextm
420 return
429 rem ===== what color? =====
430 tc=peek(sp+cl+ds)and15:return
439 rem ===== move stone =====
440 pokesp+cl,0:sp=sp+ds
450 pokesp,ob:pokesp+cl,1:return
459 rem ===== score board =====
460 sc=sc+5*(tc-1)
470 iftc=7thengosub490:gosub510:goto5
30:rem if yellow (ring)
480 return
490 ob=81:pokek+cl,0
500 print"[home]                [left][lef
t][left][left][left][left][left][left
][left][left][left]score:"sc,:return
510 k=k-1:ifk<7691then530
520 return
529 rem ----- end game -----
530 print"[home][down][right][rvs on]
[wht]play again (y or n)?"
540 geta$
550 ifa$="y"thenrun
560 ifa$<>"n"then540
570 data-23,-22,-21,-1,1,21,22,23
```


Handy AND Listing

For the VIC-20

by Eddie Johnson

```
0 rem ++++++++++++++++++++++
1 rem ++      handy and      ++
2 rem ++ unexpanded vic 20 ++
3 rem ++++++++++++++++++++++
10 print"[clr]":poke36879,8
20 poke7680,160:poke38400,1
30 forp=1to20
40 printpeek(38400),peek(38400)and15
50 next
60 goto60
```


Handy AND Listing

For the Commodore 64

by Eddie Johnson

```
0 rem ++++++++++++++++++++++
1 rem ++      handy and      ++
2 rem ++   commodore  64    ++
3 rem ++++++++++++++++++++++
10 print"[clr]":poke53281,0
20 poke1024,160:poke55296,1
30 forp=1to20
40 printpeek(55296),peek(55296)and15
50 next
60 goto60
```

Beginner's Corner

Out Of The Box With The 128 PC

by Mindy Skelton

I did it! I got myself a C-128. Oh, I know I didn't really *need* one; I was getting along quite nicely with my two little 64's. True, one of them *IS* rather old, and sooner or later I'd *have* to get a new one, and better safe than sorry . . . and it *WAS* such a bargain . . . and . . . Well, anyhow, I did it and I'm glad. This new computer is great! It has so many wonderful new features I can hardly *wait* to explore them all — so I don't think I will (I've always been an impatient sort). I'm gonna start right away. Let me invite you to join me over the next few months in an exploration of the C-128.

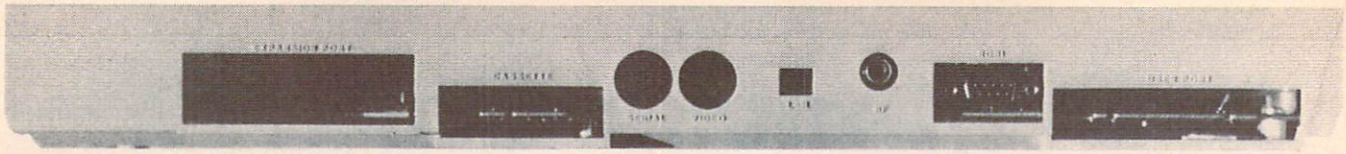
Now, as we are probably all aware, there is a lot going on in a 128. BASIC 7.0. Three different processors. RGB and composite output. CPM. Wow! Which part should we deal with first; 64 mode, 128 mode or CPM mode? Well, we've been dealing with the 64 mode (in the guise of the 64 itself) for quite a while here, and CPM is probably *not* where most folks will begin. So, by process of elimination (and a dictactorial decree by your author), next month we will begin to play around for awhile with 128 mode and its wonderful BASIC 7.0.

Hmmm . . . the lady said "next month". What does she have in mind for *this* month? Oh! I do love the questions you ask! Since this is a beginner's column, we're gonna start with the beginnings. As you'll notice at first glance, the 128 looks quite different from the 64 (OK . . . so it's not a deep insight!). Even though the main keyboard is the same, there are a whole bunch of new keys at the top of your computer, not to mention new connectors, buttons and a keypad. So, before we get to the internal workings, language, etc., we're going to look at the outside of our new computer.

The first thing that you'll probably notice as different is the number of connectors available to you when you try to hook up the video part of your system. On the 64, you had a choice of a TV connector (if you were gonna use a TV), or an audio/video connector (if you were gonna use a monitor). Well, you still have those choices on a 128, but now you have an RGB output port. Isn't that nice? Wanna know what they're all for?

If you look at the back of your 128, you will see a series of connectors. Reading from left to right you have:

1. The expansion port, otherwise known as the cartridge port
2. The cassette port, where you connect your cassette player, or parts of some printer interfaces
3. The serial port, where you connect disk drives and Commodore printers
4. The video port, where you connect composite monitors such as the 1702
5. The channel selector
6. The RF connector, where you attach the cable for the switch box which allows you to use a TV
7. The RGBI port, which allows you to use an RGB monitor such as the 1902, and, finally,



Left to right: expansion, cassette, serial, video, channel select, radio frequency (TV), Red Green Blue Intensity (RGBI) and user ports.

8. The expansion port, which allows you to connect such things as modems. Whew! What a lot of options, and why in the world do you need so many ways to hook up a TV/monitor?

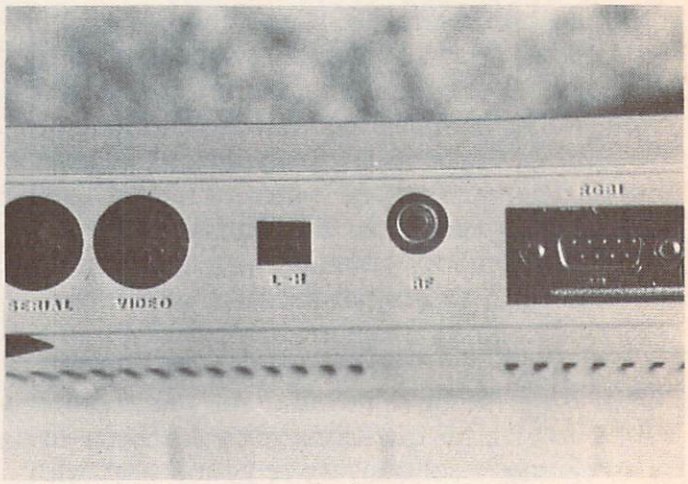
Since the 128 has so many different modes of operation (64 mode, 40-column 128 mode, 80-column 128 mode, 40-column CPM mode, 80-CPM mode), Commodore has tried to give you an option for every need (and a bit of confusion into the bargain).

Let's say all you have is a television and you want to hook it up. Take the switch box (it's the little thing with the switch on the front that lets you select TV or Computer) and simply attach your TV antenna wires to the box. Then plug one end of your connector cable into the box and one end into your computer (into connector 6 in our list). You then set your channel selector to either 3 or 4, tune your TV to the appropriate channel, and you're all set. [See pages 9-10 of your Introductory Guide if things aren't working.]

Great, but what if you want to use a monitor (or even two monitors)? No problem. There are basically two kinds of monitors; composite and RGB. A composite monitor provides a higher quality (higher resolution) display than a television, but generally does not give satisfactory output in anything but a 40-column mode (hardware and software modifications to the contrary). An RGB monitor gives higher quality output (more pixels per screen) and can give you good quality 80-column output. If you want to attach a composite monitor, (such as your 1702) to the 128, you use an interface cable with an 8 pin din plug on one end and three (or more) RCA plugs on the other end. The RCA plugs go in the back of the monitor (one for chroma, one for luma, and one for audio . . . don't worry if you have a plug left over . . . you won't need it) and the 8 pin plug goes in the back of your 128. Using this type of monitor, and this type of connection will allow you to access the 64 configuration, and the 40-column configuration of the 128 mode. If you want to use *all* the neat features of the 128, however, you need to be in the 80-column mode. And for *that* you need another kind of hookup.

To get an 80-column output, you need an RGB monitor (such as a monochrome monitor or a 1902). You attach the RGB with a 9 pin RGB cable. One end plugs into the back of your monitor and one end into the connector marked RGBI on the back of your computer.

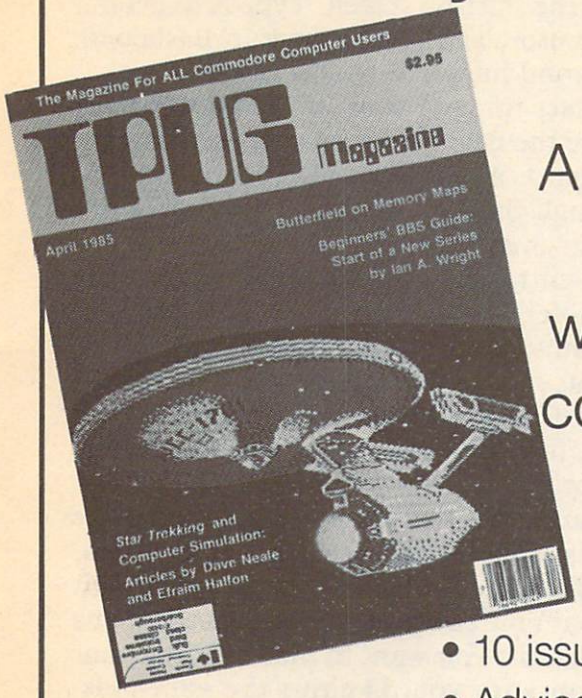
Some monitors are DUAL monitors; they have the option for both RGB and composite output (the 1902 is such a monitor). In this case, you attach both kinds of cables to the monitor and the computer and move a switch on the monitor to change back and forth between RGB and composite. If you don't have a dual monitor and wish to be able to access both kinds of output, another option is to attach two different monitors to your system. Once again you match the monitor and the appropriate connector, and switch back and forth, between say, a 1702 and a monochrome monitor.



What you get is what you see. Composit video port, channel select (L=3, H=4), TV outlet and RGBI monitor outlet.

TPUG

MORE THAN JUST ANOTHER COMPUTER MAGAZINE!



A membership in the world's largest computer club will provide you with:

- 10 issues of TPUG magazine
- Advice from experts like Jim Butterfield and Elizabeth Deal
- Access to our huge library of public domain software
- Access to our online help services
- All for only $25/yr.

TPUG
101 Duncan Mill
Suite G7
Don Mills, Ontario
CANADA
M3B 1Z3

JOIN US NOW!!

I want to join TPUG as an associate member.

Name _____ Home phone (____) _____

Address _____ Work phone (____) _____

City/Town _____ ☐ Cheque enclosed

Prov/State _____ ☐ Money order enclosed

Postal/Zip Code _____ Country _____ ☐ Visa ☐ MasterCard

My computer equipment is: _____ Card# _____

_____ Expiry _____

_____ Signature _____

There is one other alternative if you want 80-column output. You can purchase or build a cable which has the 9 pin RGB connector on one end and a regular RCA plug on the other. This cable would plug into the front connectors on a 1702 and give you 80-column monochrome output. Such a cable could also be used on a monochrome monitor which has only an RCA plug. Remember that regardless of the monitor you use, you have to be connected to the RGB connector on the computer to get RGB output. [Note: Additional information on hookup can be found in your 128 Introductory Guide on pages 5-12. A guide on how to get from one mode to another is found on page 24. Instructions on how to build the cable I mentioned are found in an article by Margaret Morabito in the October issue of *RUN* magazine.]

Well, as usual, I seem to have said more than I originally intended, but there is a lot to say here. OK . . . moving right along.

The next thing that's new and wonderful is . . . the reset switch. If you have ever had a program lock up your system, or send your program off somewhere into dreamland, and you've had to shut down the entire system to regain control (thereby losing the program in memory), you will appreciate this little switch. When you press this key in CPM mode, the system re-boots for you, but keeps you in CPM. In the 64 or 128 mode, you should get back your original start-up screen, but if you try to list the program that was in memory, you won't get anything. That's because the system reset also reset your pointers and the machine doesn't know where your program is any more. Was there a question in the back? Is there any way of avoiding "mislaying" your program? *You bet.* Simply hold down the run/stop key while you press the reset key. Now when you reset, you end up in the 128's monitor rather than with the start-up screen. Type X to get out of the monitor, and you're back in Basic with your program intact.

The last things I want to mention before closing are the new keys across the top of your 128 keyboard, and the added numeric keypad. Even though the four function keys will work for you in every mode, most of your added keys are currently non-functional in the 64 mode. [Note: I say "currently" because there are programs coming down the pike which will enable you to use the added keys in the 64 mode.] Even our old reliable function keys are slightly different in 128 mode. They are already defined for you. **f1** gets you into graphics mode so you can use all the wonderful new graphics commands. **f2** prints DLOAD" on the screen. All you then do is enter the file name and hit RETURN. You say you don't remember the name of the file you want to load? **f3** lists your disk directory for you. **f4** clears the screen (using the SCNCLR command). The **f5** key prints DSAVE" on your screen so you only have to type the program name and hit RETURN to save a program. (Every little bit helps!) **f6** RUNs the program in memory. **f7** LISTs the program in memory, and **f8** puts you into the 128's machine language monitor. All, or any, of these keys can be re-defined using the KEY command (our first 128 command!). You simply issue the command KEY followed by the number of the key you wish to re-define, a comma, and the command you wish to assign to the key. For example:

```
KEY 5, "FAST" + chr$(13)
```

would kick your 128 into fast speed when you pressed function key 5. These re-definitions are lost when you turn off the computer.

The numeric keypad is a real joy to any of us who have to input long lists of numbers. It's something that the Commodore has been needing for a long time. There are even some software packages on the market which take advantage of it being included; for example the 128 Word Writer by Timeworks has a

calculator option which shows a little calculator on the screen if you need to do some figuring while writing. You then press the numbers on the keypad to input the figures. Some fun!

The cursor keys at the top of the keyboard are duplicates in function of the cursor keys at the bottom of the keyboard. They were included (as near as I can figure) to make the Commodore more like other computers which shall remain nameless but who use initials in their names, or are named after fruit. For people who are used to having a cursor key for each direction, it's a nuisance to have to shift to access all the keys. For those of us raised on Commodore, it's second nature. In any event, you now have your choice.

A quick run through the remaining keys. NO SCROLL, as you might guess, stops the screen from scrolling until you press it again. 40/80 DISP selects whether you are in 40- or 80-column mode. LINE FEED functions much as the cursor down key might, by moving the cursor to the next line. If you get one of those less-than-helpful error messages like ?SYNTAX ERROR IN LINE 50, pressing the HELP key will show you the line in question with the trouble spot highlighted (in the 40-column mode) or underlined (in the 80-column mode). The CAPS LOCK key locks you into all upper case. This key has no effect on any keys except letters. (For example it won't print a ! when you press 1.) The ALT key is used mostly in the CPM mode. It allows you to assign a special action or string to defined keys or sets of keys. The assigned definitions can then be accessed by holding down the ALT key and the specified key. For example in CPM with ALT on, ESC T clears text to the end of the line. The TAB key moves the cursor just like the TAB key on a typewriter or word processor. When you press the key, the cursor is moved to the next defined TAB. The TABs are set for every eight columns, starting with column one. The ESC key gives you access to a number of additional functions, especially if you are using a "window". The ESC key/window combination really calls for more explanation than we have room for here, so, I think I'll call it a month and start next month off with "windows".

See you then!

Flags of Mystery (Again)

Editor's Note:

Well, pilgrims. Here we go again . . . there seems to be no end to the number of ways we can mess up. In the November, 1985 issue of The Guide, *we ran a Magic Series program entitled Flags of Mystery. The program appeared in the magazine without a single graphics character being included.*

When we first started having programs typeset, so they would print clearly and neatly, it was necessary to have Bob Richardson write a neat little program for us called Plop. This program takes the graphic symbol that appears on your screen when you press the cursor keys, the clear key, any color symbol, etc., and converts them into such words as [down], [clr], [lt blu], etc. This makes it possible to have them typeset . . . if we remember to run the program through it. Somehow, when deadline was crashing down on us, one of the test versions of Flags, the one that was set before Plop was available, was grabbed and pasted into the magazine.

We have no excuse, other than carelessness. We sincerely apologize, first to John Olsen, who does such a fine job of writing these programs for us, and then to each and every one of you who typed the program in, only to discover you had nothing when you were through. If you saved what you typed in, (as you should have?) all you need do is add the graphics, as they appear below. We offer our sincerest apologies, and a promise to try harder. I doubt very much this same mistake will happen again.

Bill Wallan

```
1 rem ..............................
2 rem :                            :
3 rem : (c) 1984  john olsen       :
4 rem :           p.o. box 181     :
5 rem :           newberg, or 97132 :
6 rem :                            :
7 rem :  placed into public domain  :
8 rem :                            :
9 rem ..............................
10 poke53280,0:poke53281,0
11 print"[clr][ctrl-n][ctrl-h]"tab(12
)"[red][rvs on]Flags of Mystery"
12 printtab(13)"[cmdr-2]by  John Olse
n"
13 dim c(4),m(3,3,1),n(3,3,1),d$(1),c
$(4)
14 fory=0to4
15 x=int(rnd(1)*4)
16 ifc(x)=0thenreadc,c$:c(x)=c:c$(x)=
c$:goto19
17 x=x+1:ifx>4thenx=0
18 goto16
19 nexty
20 data2,red,6,blue,5,green,7,yellow,
1,white
21 d$(0)="up or down"
22 d$(1)="left or right"
23 fory=0to3:forx=0to3
24 readc:m(x,y,0)=c:n(x,y,0)=c
25 readc:m(x,y,1)=c:n(x,y,1)=c
26 nextx,y
27 data0,3,1,0,3,0,1,3,1,4,0,1,3,1,4,
2,0,1,4,2,1,0,3,2,2,1,0,1,2,4,2,3
28 r=int(rnd(1)*16)
29 ifr=0theni=3:j=0
30 ifr=1theni=3:j=3:gosub50
31 ifr=2theni=0:j=3:gosub50:gosub50
32 ifr=3theni=0:j=0:gosub48
33 ifr=4theni=3:j=1
34 ifr=5theni=2:j=3:gosub50
35 ifr=6theni=0:j=2:gosub50:gosub50
36 ifr=7theni=1:j=0:gosub50:gosub50:g
osub50
37 ifr=8theni=0:j=1:gosub48
38 ifr=9theni=2:j=0:gosub48:gosub50
39 ifr=10theni=1:j=3:gosub50:gosub48
40 ifr=11theni=3:j=2:gosub50:gosub50:
gosub48
41 ifr=12theni=1:j=2
42 ifr=13theni=1:j=1:gosub50
43 ifr=14theni=2:j=1:gosub50:gosub50
44 ifr=15theni=2:j=2:gosub48
45 m1$=c$(3):m2$=c$(4):m3$=c$(0):m4$=
c$(2)
46 ifr<12thenm1$=c$(0):m2$=c$(2):m3$=
c$(3):m4$=c$(4):ifr<4thenm4$=c$(1)
47 goto52
48 fory=0to3:forx=0to3:n(x,y,0)=m(3-x
,y,0):n(x,y,1)=m(3-x,y,1):nextx,y
49 goto51
50 fory=0to3:forx=0to3:n(x,y,0)=m(y,3
-x,0):n(x,y,1)=m(y,3-x,1):nextx,y
51 fory=0to3:forx=0to3:m(x,y,0)=n(x,y
,0):m(x,y,1)=n(x,y,1):nextx,y:return
52 print"[home][down][down][down][cmd
r-8]   Place your finger on any flag
that"
53 printspc3-int(len(m1$)/2))"contain
s the color "m1$".  Press a key.";
54 print"[home][down][down][down][dow
n][down][blk][rvs on]";
55 fory=0to3:print"
                    ";
56 forx=0to3:poke646,c(n(x,y,0)):prin
t"       [blk]  ";:nextx
57 forz=1to2:print"    ";
58 forx=0to3:poke646,c(n(x,y,1)):prin
t"       [blk]  ";:nextx,z:print"
";
59 forx=0to3:poke646,c(n(x,y,0)):prin
t"       [blk]  ";:nextx:ify<3thenpri
nt" ";
```

```
60 nexty:gosub78
61 d=0:ifr/2<>int(r/2)thend=1
62 ifr=15orr=11thend=0
63 ifr=10thend=1
64 print"[home][rvs off][down][down][
down][cmdr-8]"tab(5-d)"Move your fing
er "d$(d)" to"
65 printspc8-int(len(m2$)/2))"the nea
rest "m2$".  Any key.":gosub78
66 print"[home][down][down][down]"tab
(d+5)"Now, move "d$(1-d)" to the"
67 printspc11-int(len(m3$)/2))"neares
t "m3$".  Any key.":gosub78
68 print"[home][down][down][down]"tab
(6-d)"Finally, move "d$(d)" to"
69 printspc8-int(len(m4$)/2))"the nea
rest "m4$".  Any key.":gosub78
70 poke781,5*j+6:poke782,9*i+3:poke78
3,peek(783)and254:sys65520
71 forx=1to50
72 print"[blk][rvs on]       [down][l
eft][left][left][left][left][left][le
ft]  [pur][rvs off]you[rvs on][blk]
[down][left][left][left][left][left][
left][left] [pur][rvs off]chose[rvs o
n][blk] [down][left][left][left][left
][left][left][left]       [up][up][up
][left][left][left][left][left][left]
[left]";
73 fory=1to20:nexty
74 poke646,c(n(i,j,0)):print"       [
down][left][left][left][left][left][l
eft][left]";
75 poke646,c(n(i,j,1)):print"       [
down][left][left][left][left][left][l
eft][left]       [down][left][left][l
eft][left][left][left][left]";
76 poke646,c(n(i,j,0)):print"       [
left][left][left][left][left][left][l
eft][up][up][up]";
77 fory=1to90:nexty,x:run
78 wait197,64:wait197,64,255:poke781,
3:sys59903:poke781,4:sys59903:return
```

More Computer Magic:

by John Olsen

The woman on the stage shows the audience an empty metal cylinder. Then with a wave of her hand, she pulls a variety of silk streamers from the previously empty tube. The trick? An optical illusion! The tube is double walled, the inside wall tapered back from front to back. Looking down the tube gives the illusion that it is a normal empty tube.

She then shows a large empty cage, which she covers with a large black cloth. It is then whisked away revealing a panther pacing around the cage. How is it done? Another optical illusion. You thought you saw clear to the back of the cage, but you didn't. A false back left room for a compartment containing the panther. You didn't notice the false back because it was designed with the proper perspectives to give the illusion of true depth.

And, finally, she has her male assistant lie down in a narrow box, and she proceeds to saw him in half. Could his body have dropped into the table, below the blade of the saw? Impossible, the table is only two inches thick. Or so it appears. Actually, another optical illusion has made the trick possible. The table only appears thin; it is actually thick enough to hold the body of the man.

Optical illusions are cleverly used by magicians to make their magical effects even trickier. Illusions are also used by business marketing strategists. Notice the packaging of various products. They are designed to make it look like you are getting more than you really are. Take the examples of a box of corn flakes or a bottle of pop. The shapes of the containers were not determined by accident.

The most common optical illusion of all is one that you see daily. When a series of pictures are shown to the human eye in rapid succession, they appear to be a single picture in motion. This is the basis of motion pictures and computer video games, among others.

Some of the more common optical illusions will be demonstrated in the program accompanying this article. When you type it in, be very careful to type it exactly as shown. The program involves a complicated series of graphics characters which must be entered using the appropriate keys. If this is not done exactly as shown in the listing, the optical illusions will not appear properly. If you don't feel up to manually typing the entire program, you can wait until it is released on *The Guide*'s next public domain disk.

For those of you who want a "real" magic trick, I've included (at no extra cost) a quick little trick using the serial number of a dollar bill. For those of you who are reluctant to type in the **Optical Illusions** program, this is the one for you. It uses no complicated keyboard graphics and is much shorter than the first program. It won't take long at all to type in, and will be fun to try on your friends.

The effect of the trick is to determine which digit of a serial number you have circled. You are asked to ignore some of the digits, mix up the others, circle one digit, and mix the remaining ones again. Upon giving the computer the final results, it can tell you which digit you circled.

The secret to the trick is once again veiled by misdirection. All the mixing of digits makes the trick seem harder, but is really totally irrelevant. The heart of the trick is based on an old mathematical principle called "casting out nines", and is well known to mathematicians. However, introducing the trick in its stripped-down form would not be as mystifying. So the magician's major tool, misdirection, again comes into play. What you finally have is a cute little magical effect with money.

I hope you have enjoyed this month's double feature, and will take the time to "keyboard in" both programs. If you have any ideas for a computerized magic trick, please write me in care of *The Guide*. Next month I'll be back with another mystifying magical trick that can be performed by your computer. Until then, happy computing.

■

Optical Illusions Listing

by John Olsen

```
10 poke53280,7:poke53281,7
20 printchr$(142)chr$(8)"[clr][cmdr-2
] optical illusions      [red]by joh
n olsen[down]"
30 print"  [wht][rvs on]
                        "
40 fory=1to5:forx=1to3
50 print"  [rvs on] [blk]    [wht] [b
lk]    [wht] [blk]    [wht] [blk]
[wht] [blk]    [wht] [blk]    [wht] [
blk]    [wht] "
60 nextx
70 print"  [rvs on]
                  "

80 nexty
90 print"[down][blu]  do you see gray
 at the intersections?";
100 gosub830:poke53280,1:poke53281,1
110 print"[clr][blk][down][down]"
120 print"                          M[down]
M[down]M[down]M[down]M[down]M[down]M"
130 print"[cmdr-p][cmdr-p][cmdr-p][cm
dr-p][cmdr-p][cmdr-p][cmdr-p][cmdr-p]
[cmdr-p][cmdr-p][cmdr-p][cmdr-p]
          [cmdr-y][cmdr-y][cmdr-y][cm
dr-y][cmdr-y][cmdr-y][cmdr-y][cmdr-y]
[cmdr-y][cmdr-y][cmdr-y][cmdr-y]";
140 print"                 M[down]M[down]
M[down]M[down]M[down]M[down]M"
150 print"[red][down][down][down]  th
e angles cause the two horizontal"
160 print"        lines to appear til
ted."
170 gosub830:poke53280,4:poke53281,4
180 print"[clr][blk]"
190 forx=1to10:printtab(12-x)"[rvs on
]            ";

200 fory=1tox:print"  ";:nexty
210 print"[cmdr-*]":nextx
220 print"[down][down][cmdr-6]the top
 of each figure may appear to be"
230 print"  different lengths, but ar
e actually"
240 print"             the same length
.[down][down][blk]"
250 forx=1to6:printtab(11+x)"[cmdr-*]
[rvs on] ";
260 fory=1to7-x:print"  ";:nexty
270 print"[rvs off]":nextx
280 gosub830:poke53280,1:poke53281,1
290 print"[clr][blk]"
300 forx=1to19:printtab(15)"[rvs on]
      "

310 ifx=15thenprint"[red]";
320 nextx
330 printtab(6)"[blk][rvs on]
                  "
340 print"[down][grn]this hat appears
 taller than it is wide"
350 print"however, it is actually sli
ghtly wider."
360 gosub830:poke53280,14:poke53281,1
4
370 print"[clr][down][down][down][dow
n][down][yel][cmdr-n][blk][cmdr-m][cm
dr-m][cmdr-m][cmdr-m][cmdr-m][cmdr-m]
[cmdr-m][cmdr-m][cmdr-m][cmdr-m][cmdr
-m][cmdr-m][cmdr-m][yel][cmdr-n]
          [cmdr-n][down][down][down][d
own]"
380 print"    [yel]G[blk][cmdr-k][cmd
r-k][cmdr-k][cmdr-k][cmdr-k][cmdr-k][
cmdr-k][cmdr-k][cmdr-k][cmdr-k][cmdr-
k][cmdr-k][cmdr-k][cmdr-k][yel][cmdr-
g]            [cmdr-n][down][down][d
own][down]"
390 print"        [yel][cmdr-n][blk][
rvs on]            [rvs off][yel][c
mdr-h]           G[down][down][down
][down]"
400 print"[blu]the filled or divided
space on the left"
410 print"appears larger than the equ
al space on"
420 print"the right."
430 gosub830:poke53280,0:poke53281,0
440 print"[clr]";
450 forx=1to24:printtab(15)"[pur][rvs
 on]          ":nextx
460 printtab(15)"[pur][rvs on]
  [rvs off]";
470 forx=1to3:print"[home][cmdr-7]";
480 ifx>1thenfory=1tox-1:print"[down]
";:nexty
490 printtab(6)x"[left][yel][down]M[d
own]M[down]M[down]M[down]M[down]M[dow
n]M"
500 nextx
510 printtab(24)"[yel][down][down][do
wn][down][down][down][down]M[down]M[d
own]M[down]M[down]M[down]M[down]M[dow
n]M";
520 print"[cmdr-8][up][up][up][up][up
][up][up][up][left][left][left][left]
[left]which line[down][left][left][le
ft][left][left][left][left][left][lef
t]extends[down][left][left][left][lef
t][left][left]through";
530 print"[down][left][left][left][le
ft][left][left]the block?";
540 gosub830
550 print"[yel][home][down][down][dow
n][down][down][down][down][down][righ
t][right][right][right][right][right]
[right][right][right][right][right][r
ight][right][right]M[down]M[down]M[do
wn]M[down]M[down]M[down]M[down]M[down
]M[down]M"
560 gosub830:poke53280,7:poke53281,7
570 print"[clr][yel][rvs on]
                                  ";
580 print"                schroder's
                    reversible stair
case";
```

```
590 print"
                ";
600 print"                          [rvs off]
  [red][rvs on][cyn]
    [yel]         ";
610 print"        [rvs off]  [red][rvs
 on] [cyn]                        [yel]
      ";

620 print"        [cyn][rvs on]    [red
] [rvs off]  [rvs on][cyn]
      [yel]         ";
630 print"        [cyn][rvs on]    [rvs
 off][red]  [rvs on] [cyn]
      [yel]         ";
640 print"        [cyn][rvs on]       [
red] [rvs off]  [rvs on][cyn]
      [yel]         ";
650 print"        [cyn][rvs on]       [
rvs off][red]  [rvs on] [cyn]
      [yel]         ";
660 print"        [cyn][rvs on]
  [red] [rvs off]  [rvs on][cyn]
      [yel]         ";

670 print"        [cyn][rvs on]
  [rvs off][red]  [rvs on] [cyn]
      [yel]         ";
680 print"        [cyn][rvs on]
     [red] [rvs off]  [rvs on][cyn]
      [yel]         ";
690 print"        [cyn][rvs on]
     [rvs off][red]  [rvs on] [cyn]
      [yel]         ";

700 print"        [cyn][rvs on]
      [red] [rvs off]  [rvs on][cyn
]     [yel]         ";
710 print"        [cyn][rvs on]
     [rvs off][red]  [rvs on] [cyn]
    [yel]         ";
720 print"        [cyn][rvs on]
          [red] [rvs off]  [rvs on][
cyn]   [yel]         ";
730 print"        [cyn][rvs on]
          [rvs off][red]  [rvs on] [
cyn]   [yel]         ";
740 print"        [cyn][rvs on]
            [red] [rvs off]  [yel][
rvs on]         ";
750 print"           [cyn][rvs on]
            [rvs off][red]  [yel][r
vs on]         ";
760 print"
            ";
770 print"    can you see both sets o
f stairs?    ";
780 print"           one is right-side
-up,         ";
790 print"       the other is up-side
-down.       ";
800 print"
           ";:poke2023,160:poke56295
,7
810 poke53281,0
820 gosub830:poke53280,14:poke53281,6
:print"[clr][cmdr-7]":end
830 wait197,64:wait197,64,255:return
```

Money Magic Listing

by John Olsen

```
10 p=3:poke53280,p:poke53281,p
20 print"[ctrl-n][ctrl-h][clr][blk]Mo
ney Magic                  by John Olse
n[down][down][down][down]"
30 print"For this trick, get out a $1
00 bill."
40 print"How about a $1 bill...[down]
[down][down]"
50 print"Look at the serial number.
Ignore the"
60 print"letters and any three of the
 digits."
70 gosub310
80 print"Now to really confuse things
, mix up"
90 print"the digits left and write th
e results"
100 print"down on a piece of paper.[d
own][down]"
110 print"Example: 41072":gosub310
120 print"To keep things honest, mix
the digits"
130 print"up again, and write them on
 the same"
140 print"piece of paper.[down][down]
"
150 print"Then subtract the smaller n
umber from"
160 print"the larger one.":gosub310
170 print"Now look at the answer and
circle the"
180 print"digit which looks the most
appealing"
190 print"to you.[down][down]"
200 print"Take the other digits in th
e answer and"
210 print"mix them up one last time.
 (Don't use"
220 print"the circled one).":gosub310
230 print"[down][down]What number do
you get when you mix the"
240 poke198,0:input"digits in the ans
wer";a$
250 t=0:forx=1tolen(a$):t=t+val(mid$(
a$,x,1)):nextx
260 ift>9thena$=str$(t):goto250
270 t=9-t:ift=0thent=9
280 forx=1to96:p=xand15:poke53280,p:p
oke53281,p:nextx
290 print"        [red]You circled th
e digit"t
300 forx=1to4000:nextx:run
310 print"[down][down][down]Press a k
ey to continue.":wait197,64:wait197,6
4,255
320 p=p+1:poke53280,p:poke53281,p:pri
nt"[clr][down][down][down][down][down
][down][down]":return
```

Computer Widow's Compendium

by Lyn Chase

It happened. In my very own household. A mother tries her best to rear her children properly; to instill in them a sense of dignity and worth; to help them to understand just what their priorities should be. But sometimes even the most valiant effort fails. My son, Jonathan, (age two-and-a-half) has become a ... a ... COMPUTER JUNKIE! I suppose that I can't blame myself. Having as many computers around the house as we do, it was bound to happen. Those of you who have been reading my column for the last year probably saw this coming. And now it's happened.

What caused this malady was the aquisition of two alphabet games for the computer. Actually, he had been teetering on the edge of computer junkiedom for some time. First, it was just a little social time at the keyboard. But as his need for social acceptance increased, so did his need for time with the beige brute. They say it's not addictive, but the psycho-social implications cannot be overlooked.

Let me tell you how it all began. When Jonathan was but a youth of fifteen months, he began to sit on daddy's lap while daddy did his daily quota of computing. Soon Jonathan began to hit the keys "just like daddy". A short time later, he noticed that hitting the keyboard made things happen on the screen.

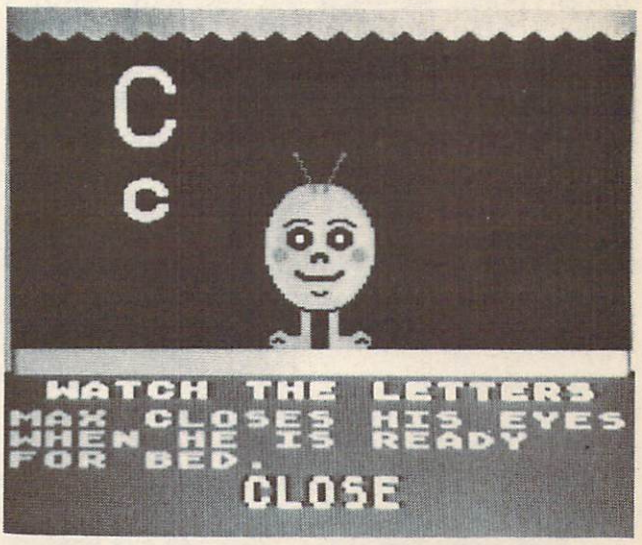
One day when we attended a computer show at the Oregon Museum of Science and Industry, Jonathan sat at the keyboard as a television news crew filmed him. In retrospect, I realize that what was preserved for posterity on that videotape was the beginning of my son's computer addiction.

Christmas soon arrived, and Randy convinced me that Jonathan really needed a **Muppet Learning Keys**. This is a colorful keyboard made just for children and plugs into the computer just like a joystick. (If you do not know what a joystick is, read my column in the March/April 1985 issue of *The Guide*.) Jonathan took an immediate liking to the **Muppet Pad** and spent a little time with it each day, but I wasn't worried. After all, his mother is a Computer Widow. And I watch him like a hawk. He gets quality time. And he gets quantity time. And he has LEGO's! We watch Sesame Street twice a day. (I love Kermit's newscasts.)

A few months later, however, he was running to the computer saying "Pooter, Mommy! Disk Mommy!". And of course, Daddy was thrilled. I don't think Daddy would have been happier if Jonathan had said, "Basketball, Daddy! Bill Walton!" (The only thing that topped it as far as Daddy was concerned was when Jonathan said, "I like nice rock and roll, Daddy!".)

When Jonathan turned two, he tired of his **Muppet Pad** (although new software has recently become available for it so his interest may be rekindled). Daddy came up with a new game called **Leaps and Bounds**. This allowed Jonathan to use the keyboard or joystick to help him learn the alphabet, recognize numbers, and make drawings or musical sounds.

This interested him for months — until he began trying to put the disk in the drive by himself. Bye-bye, **Leaps and Bounds**. He would ask me from time to time if he could play his ABC game, and was saddened when I would tell him it was broken.



The character "Max" illustrates actions that accompany example words.

He settled for occasional (once a day) rounds of **Jumpman**, **Pacman** or **Panic Planet**. Then, a few weeks ago, Jonathan discovered **Talking Teacher** and Romper Room's **I Love My Alphabet** games. Both of these games teach the child the alphabet and allow the child to work independently. They also personify the computer and make it seem like the child's best buddy. Let me tell you about these games so that you can understand my concern.

Romper Room's **I Love My Alphabet**, by First Star Software, employs a little character named Max to pull letters onto the screen, and to perform actions demonstrating the use of a particular letter (for example, he dances to demonstrate a word starting with the letter "D").

The first of the four levels of the game requires no action by the child. The child simply watches Max work his way through the alphabet. On level two, you press a letter, and Max will show you something that starts with whatever letter you pressed. On level three, Max pulls a letter onto the screen and the child must match the letter on the keyboard. Level four is the letter quiz (he's two-and-a-half and already he's learning how to take tests!). Max does something and the child must choose the appropriate letter (based on Max's previous demonstrations).

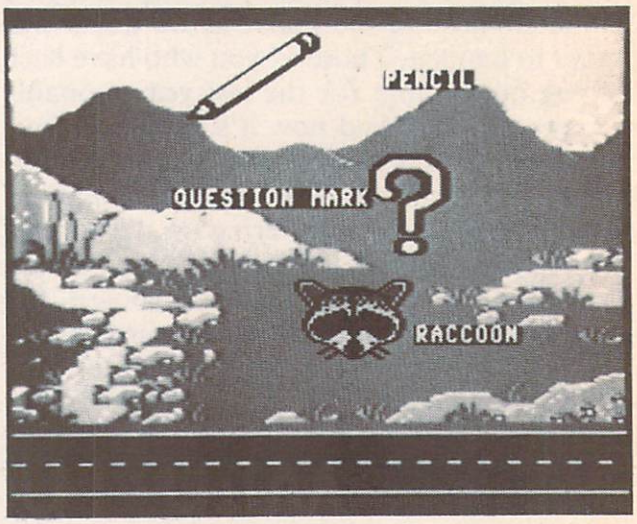
I didn't think this was such a wonderful game. After all, Max did some confusing things. When we tried out the letter quiz, I flunked. Max closed his eyes. Was he resting (R), sleeping (S), becoming introverted (I)? I couldn't tell. It turned out that Max was being quiet (Q). I began to resent this game and expected it to quietly (Q) find its way to the bad disk pile, but Jonathan got up the next morning and said, "Mommy, I want to play my Max game!". Yes, Max had become his friend.

The **Talking Teacher** game by Imagic has a little less warmth, but a little more direction. It has a digitized voice that speaks directly to the child. And because it is digitized rather than synthesized, it sounds a little like Mr. Rogers. Jonathan loves Mr. Rogers. And he loves "my talking ABC game".

This game has three levels. At the beginning level, the child can press any letter. A hand writes the letter in both upper and lower case on the blackboard and the "teacher" says the letter.

On level two, the "teacher" says, "A — can you find the letter A on the keyboard? Press it when you do." When the child responds appropriately, the letter leaves the classroom and finds its way to a beautiful valley, wherein resides, of all things, an object starting with the letter "A". The "teacher" then says, "Alligator begins with the letter A. Can you find the letter A?"

This continues through the entire alphabet. There are several different objects for each letter, so the game is not always the same each time it is played.



Letters of the alphabet travel through multiple screens on highway in foreground in search of a match.

At the advanced level, an object appears in the classroom and the "teacher" asks what letter it starts with. Now *that's* preparing for the SAT's a little early, isn't it?

In both of these games, the computer talks to the children and becomes their friend. Think of the implications! How will the child develop socially and emotionally? Instead of a "My Buddy" doll the child will ask for "Scooby-Doo's I Love My Trigonometry" game. Instead of a doggy or a kitty, the child will plead for a **Little People** game. (Yes, there really is a **Little People** game which requires the people in the computer to be fed, watered and read to. Just what every housewife needs.)

Why can't kids do what we did back in the '50's? I don't remember just what we did, but we turned out alright — didn't we?

■

Commodore 128 PC:
The CP/M Machine

by Grant Johnson

Commodore owners have come to expect their computers to be READY to go as soon as they turn them on. Yet, not so many years ago, such READYness was considered a fabulous luxury. In fact, the time was when you would have had to enter at least a short program into memory with front panel switches to get a microcomputer to do anything at all.

In The Beginning

These early machines (and the full-sized computers that preceded them) had two shortcomings: They had *tiny* memories, and what memory they had was empty. In contrast, the 64 has something like 16K (16,384 characters) of memory already full of program. This program is what gets the 64 out on the right side of bed and gives it that BASICally READY-made personality.

At the dawn of the micro age, the machines had memories typically only five percent as large as a 64. Hand-entering programs each time you want to use a computer is error-prone, and no one's idea of a good time. So, micros found themselves attached first to paper tape readers, and then to cassette tape recorders.

Even with these storage devices, you still needed some way to move the program from the tape to the computer. It didn't take long for the microcomputer world to realize that what was needed was an "operator" program like those in use by the big machines. Something that would let the computer listen to the keyboard, respond on a screen and retrieve things from auxiliary memory devices. Just such an operating system, Control Program for Microcomputers (CP/M), came into being at about the time that disk drives were first being connected to micros.

A Little History

Among the early disk enthusiasts was one Gary Kildall. Kildall did several things right. He got John Trodode to build a disk controller while he wrote software to work as a file manager, and he had the good sense (with some help from IMSA's Glenn Ewing) to make the new system easily transportable among different machines. The basic code ran on Intel-designed processors (8080, and, later, the Z80), and the part of the program that changed from computer to computer was confined to a single module. Each new manufacturer wanting to use this system (and nearly everybody *was* using Intel's chips), had to modify only this module.

The Kick-off

To appreciate CP/M's charms, imagine you are the owner of one dumb computer helplessly attached to a waiting disk drive. To be fair, computers are not completely stupid. If they were, you would see some very bizarre behavior when you turned one on. Instead, the processor is held inactive while voltage levels rise and the power supply stablizes. Once released, the processor executes a housekeeping program that sets registers to their startup values, checks memory, etc. To this, CP/M adds one more job. The computer looks for and loads a program called a "boot strap" or "booter" (from the phrase "to pick yourself up by the boot straps"). It is the boot program's job, in turn, to get the more central parts of the CP/M system off the disk and into the computer. Consequently, to start up a CP/M computer, you simply place a CP/M

system disk in the drive and turn on the computer (or press the reset on the 128). What could be simpler?

This startup process results in three things being moved from disk to computer. Here we enter the alphabet soup CP/M is famous for. They are: BIOS, BDOS and CCP. Let's take them in reverse order.

What's a CCP?

To do your bidding, CP/M needs to be able to communicate with you. This important function is handled by the Console Command Processor (CCP). Now that many computers come in a single small box, "console" is a term that is getting increasingly quaint. Time was when the white-coated technologically elite huddled around consoles like the operators of great pipe organs. Now, it is mostly a keyboard with a monitor screen nearby.

Got a program to load and run, a file to list, create or scratch? It is CCP's job to interpret your wishes and see that they are carried out.

BDOS

BDOS stands for Basic (*not* BASIC) Disk Operating System. It is your link with the disk drive and all the good stuff stored therein. Think of BDOS as a clerk who quietly goes about his job of filing. He locates the files and records that are called for, allocates storage space for things to be stored, and makes sure that your disks are maintained in an orderly manner. By the way, BDOS actually takes control of your drive and even writes his disks in a format different from that normally seen on Commodore equipment. More about that later.

BIOS

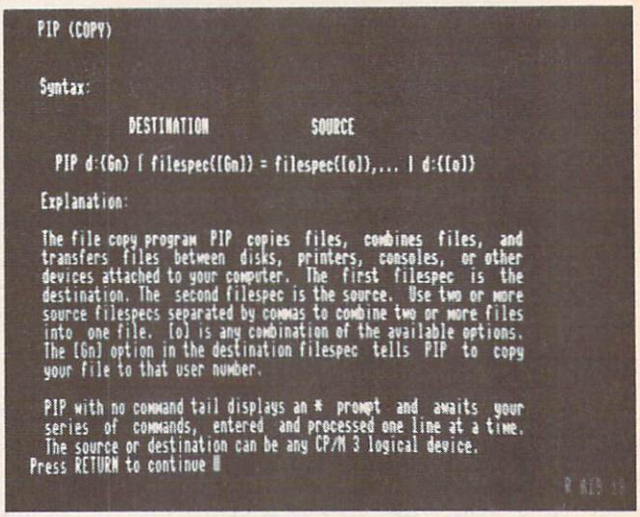
You may have noticed that CCP and BDOS are both heavily involved in the input and output of information. At the same time, CP/M can be found on a wide range of different machines. When you want to erase a file from a disk, the order is taken by CCP, the BDOS clerk does his thing and it matters not what brand of computer or disk drive you are using. The command you issue is always the same; as is the result.

This bit of magic is accomplished by the Basic Input/Output System (BIOS). BIOS works as a sort of switchboard within the CP/M system. When BDOS wants to talk to the disk drive or CCP needs commands from the keyboard, it is BIOS's job to make sure the connections are made.

While the details of *how* BIOS does what it does differ from computer to computer, a properly set-up BIOS (the manufacturer's job, not yours) should be quite invisible. It is this changeable BIOS that made CP/M portable and popular.

TPA

So far, we have a good start on the *empty* memory problem, but what about the *small* memory problem? CP/M's solution was to employ the same area of memory for many different uses. The idea is to keep the programs or functions in relatively small units and store them on the disk. Then, when you have need of one, CP/M pulls it off the disk and executes it. Move on to the next job, and CP/M swaps in



Start of PIP help file. Most help file run several screens. In addition, help files come with multiple sub-files that discuss options and even give examples.

the next unit. In CP/M-speak, this busy section of computer memory is called the Transient Program Area (TPA).

Who Cares?

Tiny memories are now just a fading memory, and those of us with Commodore keyboards under our fingers have long had BASIC operating systems that work just fine. Moreover, the BASIC in the 128 PC is the best ever. So why bother giving the 128 CP/M?

CP/M went on from its humble beginnings to become *the* dominant operating system for microcomputers. Well over a billion dollars in software and equipment changed hands with the characters "CP/M" attached to it, and pyramids could have been built with the hours of programming time invested in it. As recently as five years ago, the most popular, most sophisticated and widest selection of microcomputer software on earth was all CP/M. And the largest public domain (free!) libraries are probably *still* CP/M. Do you care about that? Well *I* do.

A Second Try

Not many 64 owners know it, but Commodore tried to open the world of CP/M to us once before. A cartridge (that plugged into the expansion, or "game", port) was actually sold for the 64, but not much came of it. It was caught in a sort of chicken and egg problem. Few people bought the cartridge because there was no software to run on it, and no one made software available because there were so few cartridges being sold. The primary stumbling block was that Commodore uses its own unique disk format; the 1541 disk drive could not, by itself, read any of the popular (i.e., available) CP/M disk formats.

Commodore clearly intends to avoid such frustration with the 128. First, *every* 128 comes with a second CP/M-capable processor chip built right in (the Z80-A). Second, the new 1571 disk drive has been optimized to be able to read most CP/M diskettes without reformatting.

The Drive to CP/M

All Commodore disk drives use a method called Group Code Recording (GCR). This is a mixed blessing, but what GCR lacks in compatibility it makes up for in efficient use of disk surface. All else being equal, you can put more data on a Commodore formatted diskette than others. The rest of the world uses the Modified Frequency Modulation (MFM) technique. Unfortunately there are many species of genus MFM, but the 1571 is adaptable (programmable) and can cope with most of them. What all this means is that you can pull a disk out of your neighbor's CP/M machine, push it into a 1571 and run his programs on a 128. Good diplomacy, however, requires that you keep in mind that the neighbor probably spent $3500 on his system. Don't rub it in. Shore up his wounded ego by letting him give you CP/M lessons (and his favorite utility programs).

Working with CP/M

The first thing with which you are confronted after loading CP/M is the "A>" prompt. CP/M is set up to work with four disk devices. Unlike Commodore's disk operating system, they are designated "A" through "D" rather than "8" through "11". The "A" just means that disk device "A" is the current drive, and the ">" is the CP/M operating system's "signature". When you are working with other parts of CP/M, you will see other promts such as PIP's (see below) "*".

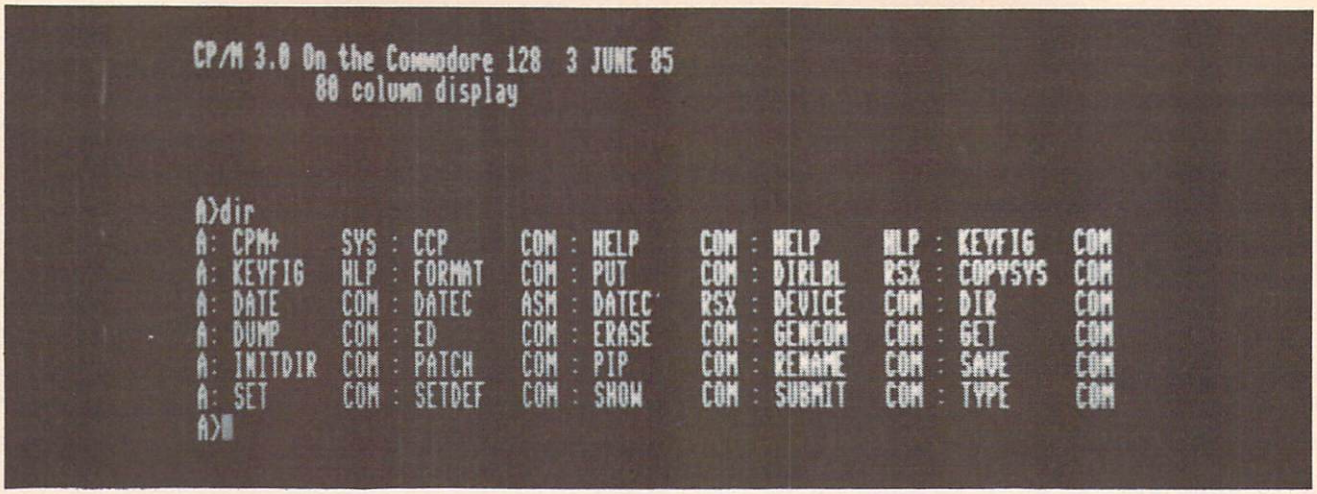
Some of the commands issued are executed immediately, while the computer will first access the disk before doing others. The former are termed resident, or built-in, commands, since the code that executes them is always in memory. The latter are transient commands and must be loaded from disk. There are six resident commands:

DIR	Gets you a directory.
RENAME	Renames a disk file.
ERASE	Scratch a file from disk.
TYPE	Prints contents of file.
SAVE	Saves contents of memory as disk file.
USER	Changes user number.

CP/M is modular and disk oriented. The above commands, issued in simple form, will execute immediately. There are options that you can add to these commands (there are at least ten optional parameters for DIR alone) that will cause CP/M to go to the disk for additional code.

Pulling transient commands off the disk whenever you wish to do more than the most basic of operations is not nearly the liability most people expect. The trade-off is that the CP/M "operating system" is expandable to the limits of disk storage. The facilities that come on the CP/M system disk reflect this in their power, flexibility and ease of use.

Take PIP (Peripheral Interchange Program), a transient command which, as its name implies, is a program all by itself. Programs,



Use of DIR command. Files listed are those that come on CP/M system disk.

such as word processors and speadsheets, are loaded and run in much the same way as commands. With PIP you can copy any file on any device (including the computer itself) to any other device. You can throw around groups of files or whole disks of information with just a few keystrokes. PIP is a very smooth operator — taking errors, duplicate files and even missing peripherals in stride. When a system such as CP/M has been around as long as this, rough edges are hard to find.

Another of the transient commands, one that will be of special interest to first time users, is HELP. The HELP files *are* helpful — and quite extensive. If you are at all savvy about computers, these on-line files make the coverage in the *Personal Computer System Guide* (the book that comes with the 128) unnecessary. More in-depth coverage can be had, for $19.95, from Commodore Direct Marketing, DRI Offer, C-2651, West Chester, Pennsylvania 19380 (six to eight weeks of patience, please).

Future-drive

No discussion of the hardware side of CP/M on the 128 would be complete without mentioning Commodore's soon to be released RAM disk. This device is a small cartridge that contains up to a half-million bytes of storage. Logically, it functions as if it were a very, very fast disk. From BASIC, you STASH data to it, and FETCH it back. Under CP/M you can move your most-used "commands" to this expansion module, and have the equivalent of a giant operating system under your finger tips.

Also of special interest to CP/M users will be the hard disk said to be coming for the 128. Such a device would combine vast storage with an access speed somewhere between RAM disk and floppy drives.

Memory-Ware

A recent prime minister of Canada once commented that living next to the United States was, economically, " ... like sleeping with an elephant". Many in the computer industry have had similar thoughts after IBM has rolled over on them. So it was with Digital Research, Inc. (DRI), the company Gary Kildall and CP/M built. When IBM moved into the personal computer market, there were two suiters trying to become *the* operating system for 16-bit computers. DRI offered CP/M 86, and Microsoft pushed the upstart MS-DOS. IBM took up with MS-DOS, and DRI went home feeling ... well ... Canadian.

With CP/M "out of favor" in recent years, it has now become hard to find CP/M software on the store shelves. It *is* still in the catalogs, but, unfortunately, much of it still at the prices that $4000 computers encourage. Anyone for **Multiplan** at $250, **WordStar** at $495 ($745 with **MailMerge**), or **Pascal MT+** at $500? I'll pass. Come on guys, no use in letting all that stuff molder away in some vault becoming just a memory. Put a two-digit price on those packages, and get them moving again!

In the meantime, I'll dig through the free bin at user groups, and continue to explore this fascinating side of the Commodore 128 PC.

■

Real Gamers Don't Read Instructions

by Robert J. Sodaro

In our last outing, we discussed four games from the folks at Epyx. (Actually, I discussed them — you were merely my captive audience.) But, it wasn't until I received that particular issue of *The Guide* that I realized that I had committed a professional no-no. I spent several pages writing about the merits (or lack thereof) of Epyx' games, yet I failed to give you their address.

What a loghead I am.

I will attempt to rectify that grievous error with the following information:

Epyx, Inc.
1043 Kiel Court
Sunnyvale, CA 94089
(408) 745-0700

That done, I will move on to new business. As you may or may not remember, I finished the last article with a promise to review several new Activision games . . . I lied.

Actually, I didn't — I sincerely meant to review Activision games this time out, but I didn't receive them in time to give them a fair look, so I'm going to save them for a future column. In the meantime, I'll discuss a few other products I've been playing with. They include a pair from CBS Software (now doing business as CBS Educational Software, or some such — more later), one from Abacus, one from Broderbund/Synapse, and a brief report on a pair of printers. (*Printers? I thought this was a gaming column!* — Shutup! It's *my* column, so I'll do what I want!)

First, the pair from CBS: **The Keys to Responsible Driving** and **The Body in Focus. Keys** is a new driving program that has picked up a lot of favorable response here in Connecticut, since a local high school (Wilton HS in Wilton) is now using it as a supplement to their Driver's Ed program. **Keys** takes the user through all phases of driver's education, including testing of control skills, sign recognition, reaction time, city, town, and highway driving.

The program is well laid out and fully documented. The manual even includes a glossary of terms. **Keys** does, however, carry the disclaimer that any testing — either text, oral, or on the computer — is *no* substitute for actually driving on the road with a qualified instructor. It further states that CBS takes no responsibility for the user's driving ability after having viewed their program. In spite of this minor legalism, the program is a shining example of what programmers and educators can do if they put their minds together and actually attempt something worthwhile.

The local Chevy Car Dealer Association is looking into sponsoring the use of the program in other Connecticut high schools. If you wish to know how to set up this study program in your school system, contact Kathleen S. McGowan, Director of Public Relations, CBS (Educational) Software, One Fawcett Place, Greenwich, CT 06836, phone: (203) 622-2500. Tell her I sent you.

The second CBS "game" we will talk about is **The Body in Focus**. Again, we see a

serious attempt to utilize the full potential of the computer as a technological teaching tool, and not as just another fancy dust collector that can also amuse our children while we are off elsewhere.

This program is designed to assist students of all ages in discovering more about that wondrous organ we call the human body. The three-part program first investigates eight body systems, then offers close-ups on the major organs and systems. Last, but not least, is a testing section that will assess what you have learned, asking you a series of 20 randomly generated questions.

My only gripe with the program is the limited selection of topics offered. It offers close-ups of the head, arm and torso. But, it never examines the leg or delves into the reproductive system. In CBS's defense, I can understand that the reproduction issue puts them into a rather delicate position. I'm not sure I would want my youngster poking around with that part of the program before I was ready to discuss it with him or her. On the other hand, leaving out a close-up section on the leg was just plain silly.

The end result is a program that scores a big 90% in design and execution. If you can't find it in your local compu-shop, contact CBS at the above address, and I'm sure they'll help you out. One thing I perhaps should mention ... **The Body in Focus** is not yet available for the Commodore 64. I previewed an (*Gasp!*) Apple version. But, I have been assured that a C-64/128 version should be available before the end of the year. (The driving program, however, is currently available for the Commodore.)

Needless to say, it is because of programs like these (and the many other fine educational programs under CBS's umbrella) that they decided on a name change. They are more than just another software house; and they make more than just games. I believe them to be the first of a new breed of educational software developers/designers/marketers. They have produced some of the best educational programs that I've seen.

My comment about the Abacus program, **Super C** is limited to the following:

When software requires special symbols or functions to be used during early stages of the program, why is it that there is seldom, if ever, an immediate footnote either telling you how to produce it, or telling you where to look to find out how? — e.g. "The checkmark found in problem #1 is achieved by hitting the SHIFT and British Pound keys (see page 104)," or, "Prior to SAVing information to disk (see page 13) you must first format said disk according to the directions found on page 15." Or, better yet, write the friggin' manual so as to provide information to the user in the order in which you can logically expect the user to need it — *not* bass-ackwards!!

It took me nearly two frustrating hours of agonized searching to discover that the information I needed on page five of the manual was provided some 90 pages further into the blessed book. Someday I'm gonna kill me a copywriter — and it's gonna be fun!!

Next on today's agenda is **Print Shop's Graphic Library (Disk 2)**. This program, just out from Broderbund/Synapse, adds over 100 new pre-designed characters and/or designs to **Print Shop**'s repertoire. Another pair of disks

are promised, and the possibility exists that one of them may appear before the end of the year. I just now determined that the new doo-dahs increase the versatility of **Print Shop** to the extent that it warrants a full-scale review all of its own — which I'll provide in the coming months. For now, I will limit my comments to a few words.

I have a tendency to *not* send cards, since I just don't have the patience required to stand in a stationery shop and read endless offerings that are neither cute nor funny. But, with the help of **Print Shop** and the new graphic library, I've sent out more cards, banners and whatnot in the last month than I had sent in the previous five years — and I'm having a great time doing it. (I'm almost embarrassed to admit it, but using **Print Shop** is more fun than playing some of the games I've been sent lately.) It is brought to us by the folks at Broderbund/Synapse, 17 Paul Drive, San Raphael, CA 94903-2101, phone: (415) 479-1170.

This brings us to the last topic — printers. These days, I'm using a pair of them: a Star Micronics SG-10C and a GE/TXP-8100. Neither of them have need of a connecting interface, since both come with a built-in interface. [The GE printer's interface is sold separately, but is available from GE, and is attached (and wired) directly to the printer.] You operate them just like you would any other printer, with one interesting catch. To the C-64 and to the C-128, they both look just like a Commodore 1526 printer. For instance, when using **Print Shop**, you would have to use the Commodore side of the disk to get a printout. I attempted to use the Gemini 10X configuration with both **Print Shop** and **PaperClip** (the SG-10C is Star Micronics' replacement machine for the older 10X and even the more recent SG-10) with divergent results. With **Print Shop**, I simply got a "Set-up procedure not completed" message. With **PaperClip**, I received several pages of nicely printed gibberish.

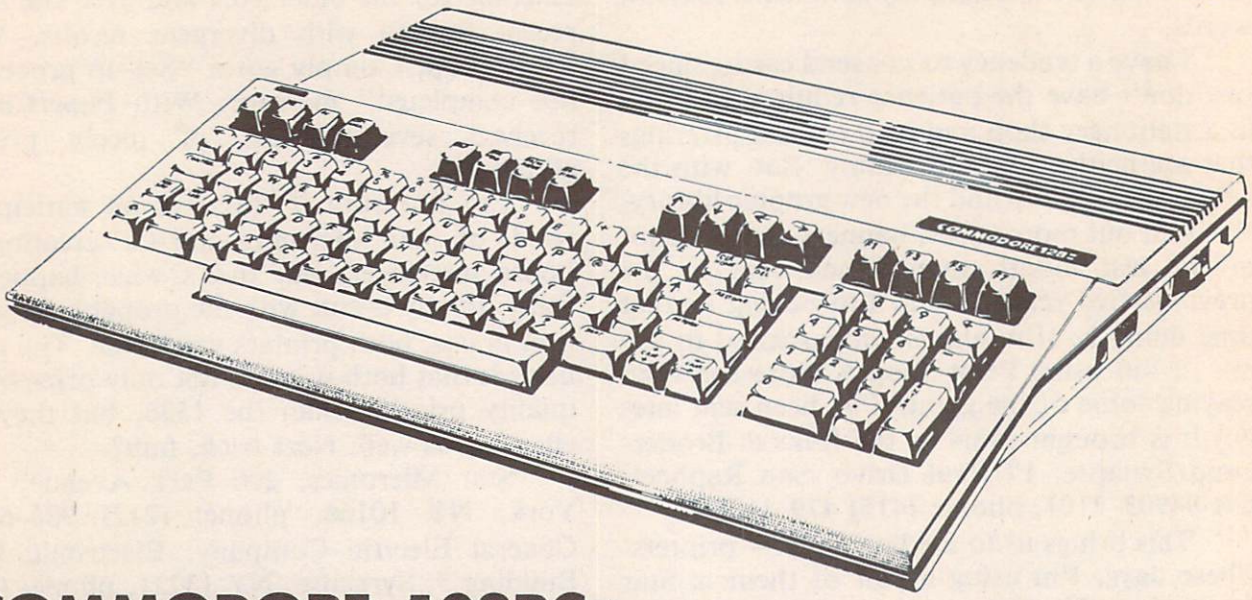
I'm not sure if this was an anticipated result of Star Micronics and GE creating in-house interfaces, but that's what happened, folks. In any event, with the proper configuration in use, both printers work well. The good news is that both printers not only offer better quality printing than the 1526, but they are cheaper, as well. Neat trick, huh?

Star Micronics, 200 Park Avenue, New York, NY 10166, phone: (212) 986-6770. General Electric Company, Electronic Park Building 5, Syracuse, NY 13221, phone: (315) 456-2446.

That's all for now, people. Next time out I promise that I'll return to the subject of games, and I'll talk about a whole passle of new stuff, as well as some classic older games that you might have missed. 'Til then, keep those joysticks greased and the microchips hot!

■

commodore 128PC



COMMODORE 128PC

The new Commodore 128PC is a computer breakthrough with all the power of its competition at half the price! Features 128K RAM for advanced applications and increased productivity, user selectable 40 / 80 column full color display, numeric key pad to increase data entry efficiency and accuracy, user expandable to 512K for rapid data access with RAM disk expansion modules. 100% compatible with Commodore 64 software and peripherals and most off-the-shelf CP/M software.

Available soon at the following dealers:

Computron
1139 SW 11th Ave
Portland, OR

Computron
11705 SW Pacific Hwy
Tigard, OR

Computers Etc.
1513 NE 122nd Ave
Portland, OR

Computer Mart
2700 NE Andresen Rd
Vancouver, WA

Computron
1142 Willagillespie Rd
Eugene, OR

Computron
64 W Nob Hill
Yakima, WA

Users Corner
1133 S Riverside
Medford, OR

Tumwater Video
5109 Capital Bv
Tumwater, WA

Computers Plus
2504 Jefferson
Tacoma, WA

Micro-Plus
823 W Main
Sumner, WA

Computer Software Whse
25234 Pacific Hwy
Kent, WA

Programmers Plus
16850 S Center Pkwy
Tukwila, WA

Software Express
21914 NE 112th
Battleground, WA

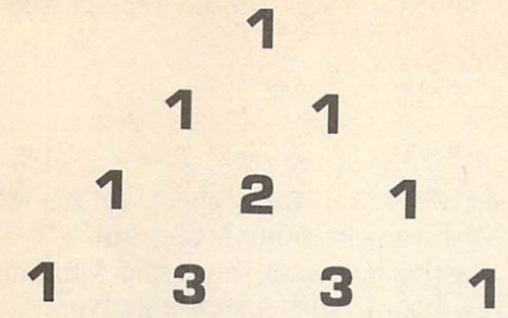
Com-Soft
1831 Silver Lake Rd
Everett, WA

Royal Mobile Sound
613 SE Emigrant
Pendleton, OR

Soft Line
1700 Hwy 160
Port Orchard, WA

Computer Communications
17602 Hwy 99
Linwood, WA

Colville Computers
136 E 4th
Colville, WA



PASCAL'S TRIANGLE

by Carmen Artino

Formatted Output

Formatting the results of our programs is usually a problem that we have to solve at one time or another and most programming languages provide for this with varying degrees of ease. For example, FORTRAN, with its FORMAT statement, provides for rather extensive and sophisticated print formatting. Version 2 BASIC on the Commodore 64 provides *some* help with TAB and SPC functions and the ability to PRINT cursor commands in quote mode.

Formatting printed output is, however, another matter. If we only had PRINT USING or PRINTAT! (BASIC Version 7 will be a blessing after using Version 2 for several years).

Pascal, on the other hand, provides almost no help at all. When Wirth designed the language, it was to be used as a teaching tool and formatting output had little importance in this context. Pascal was to be used to teach prospective computer science students about abstract data types, how to handle all sorts of data structures such as trees, arrays of various dimensions, sets, linked lists of various types, etc. I/O was to be handled by the procedures READ, READLN, WRITE, and WRITELN and, to a lesser degree, PUT and GET; no bells, no whistles. Now, some 15 years later, the context has changed. There is a plethora of Pascal installations on main frame computers and the number of compilers available for microcomputers is quite large. I know of at least five available for the Commodore 64 alone! The ability to properly format output is becoming increasingly important as more and more of these users develop programs for their own use or for sale to others.

In this column, I would like to confront the problem of screen formatting and, to a lesser extent, formatting printed output. I am, of course, using the Oxford Pascal compiler; your compiler may or may not provide for such formatting. If it does, great; if not, perhaps you can modify the PROCEDURE given here so that it will work with your version. For example, KMMM users will have no trouble doing so as we shall soon see.

```
  PROCEDURE cursor(row:0..24; column:0.
.39);
    BEGIN
     WRITE(CHR(19));
      IF row <> 0 THEN
        BEGIN
          POKE(214, row-1);
          WRITELN
        END;
      POKE(211, column)
    END;
```

This procedure, when called, will place the cursor on the screen at whatever row and column is specified in the parameters. Following the call by a WRITE or WRITELN will then place your message on the screen starting at the specified position. With judicious use of this procedure, screen formatting becomes a simple task. I have included an example of its use by modifying the program presented here last time. The example will display Pascal's Triangle so that it actually looks like a triangle!

How does it work? Oxford Pascal uses the I/O routines provided by the operating system

Editor's Note:

The Subrange —

Pascal is anything but careless about the declaration of variables. You and I know that the standard model hand has five fingers on it. If we were working with a variable that was used to count the fingers on one hand, we would clearly know that something had gone wrong when we got to six. If we made the declaration:

```
VAR
    Fingers: INTEGER;
```

the computer would be only too happy to accept a figure of six. In fact any integer that the machine could compute — even a negative one — would be just fine! Pascal allows us to avoid such nonsense by specifying the appropriate range for each variable.

```
VAR
    Fingers: 1..5;
```

In English, this says, "Set up a place labled 'Fingers', which may only contain the integer values one through five." Now, instead of the full range of all computable integers, we only have to deal with the declared subrange. (Note that the starting value and ending value of the subrange are separated by ".." not " . . . ". Some programmers call the two dot symbol a "lazy colon" so as not to confuse it with an ellipsis.)

While not all microcomputer based Pascal compilers actually check a variable's range every time it is used, it still makes the program more readable to humans. If the program says "Days: 1..31", you know at a glance that we're talking "of the month", not "of the year". *Grant Johnson*

in the Commodore 64. These routines use two page zero locations to hold the current location of the screen cursor. Poking these locations with the desired screen coordinates will then put the cursor at the position specified.

The first WRITE statement sends the cursor home (upper left corner of the screen). If a row other than row 0 is desired, its number is poked into location 214 and a WRITELN is executed to update certain pointers. Then the column number is poked into 211.

(KMMM users should replace the pokes with:

```
MEM[$D6] := row - 1
```

and

```
MEM[$D3] := column
```

respectively. But first, check to see whether KMMM uses the same I/O routines!)

Lastly, note that range checking has been provided for by using subrange types for both row and column — values outside the ranges specified will return a run time error.

Formatting output to the printer is not quite as involved simply because the paper passes through the printer in one direction: out! I shall provide only a method for positioning the print head at a given point on a line; one should be able to easily see how to modify the procedure to advance the paper a specified number of lines.

```
  PROCEDURE htab(VAR device:TEXT; pos:0-
..80);
  BEGIN
    WRITE(device,CHR(27),CHR(98),CHR(po-
s))
  END;
```

First, let me say that this procedure contains CHR codes specific to Star Micronics printers (mine is an SG 10); look up the corresponding codes for your printer. Its purpose is to advance the print head horizontally on its current line to the position specified in the parameter pos. Note that since device is declared as a TEXT file, it must be passed as a VAR parameter. Include tab whenever you wish to so move the printer's head, see the example. By changing the CHR codes slightly, a procedure can be written which would advance the paper n lines. Don't forget that the standard procedure PAGE will do a form feed when referring to the printer; i.e., PAGE(device).

Here, then, is the program that was provided last time, modified to include these procedures; it provides an example of their use.

```
PROGRAM triangle(INPUT,OUTPUT,printer);
VAR n,r:INTEGER;
    printer:TEXT;
PROCEDURE cursor(row:0..24; column:0..39
);
  (* The rest is as above *)
PROCEDURE htab(VAR device:TEXT; pos:0..8
0);
  (* as above *)
PROCEDURE pascal(n,r:INTEGER);
  (* as given last time *)
BEGIN  (* Main Program *)
```

```
REWRITE(printer,4,5);  (* Opens the prin
ter; secondary address of 5
                       puts interface
 in transparent mode. *)
PAGE;
BORDER(5);SCREEN(1):PEN(6);  (* set colo
rs on screen *)
FOR n:=Ø TO 8 DO
  BEGIN
    cursor(n,16-2*n); tab(printer, 36-2*
n); (* Adjust cursor and
       print head *)
    FOR r:=Ø TO n DO
      BEGIN
        WRITE(pascal(n,r):4);          (*
 Write to the screen *)
        WRITE(printer,pascal(n,r):4)   (*
 Write to the printer *)
      END;
    WRITELN;WRITELN(printer)  (* Send li
ne feed, both devices *)
  END;
  CLOSE(printer);  (* closes the printer
; not standard pascal *)
  WHILE GETKEY = CHR(Ø) DO;
END.
```

Added notes for Commodore Printer owners:

During the past few weeks, several friends have ask me how to interface Oxford Pascal with their printers and invariably, these people were owners of Commodore printers. Since there was so much interest, I decided to do a little research. I was quite surprised at what I learned; namely, Oxford Pascal will not interface properly with a 1525/MPS 801 type printer. This appears to be a bug in the product! Moreover, Oxford Pascal does *not* send a line feed after a carriage return, so the dip switch on your printer that controls this function must be set properly. If you wish to get a listing of your program on your printer, make sure your interface is locked in transparent mode, then type DUMP from the editor. Also, make sure you POKE49153,1 from the editor. This location is supposed to control the printer type (ASCII or CBM). I'm not sure it has any effect, but the POKE can't hurt. If you have a 1525 type printer, you appear to be out of luck in this regard.

The author welcomes comments and suggestions concerning this column. The interested reader may write to the author at P.O. Box 43, Guilderland, NY 12084.

User Group Directory

Arizona

Central Arizona PET People
842 W. Calle Del Norte
Chandler, AZ 85224

VIC Users Group
2612 E. Covina
Mesa, AZ 85203

ACUG
2028 W. Camelback Road
Phoenix, AZ 85015

Prescott Area Commodore Club
P.O. Box 26532
Prescott Valley, AZ 86312

Catalina Commodore Computer Club
201 Z Avenida Guillermo
Tucson, AZ 85710

California

Auburn Commodore Club
11210 Mira Loma Drive
Auburn, CA 95603

Valley Computer Club
2006 Magnolia Blvd.
Burbank, CA 91506

CUTG
P.O. Box 1497
Costa Mesa, CA 92628

Commodore 64 West User Group
P.O. Box 346
Culver City, CA 90230

Humboldt Commodore Users Group
P.O. Box 6502
Eureka, CA 95501

Sixty Forum
P.O. Box 16098
Fresno, CA 93755

Commodore 64 Club
1804 N. Dundee
Highland, CA 92346

Sacramento Commodore Computer Club
P.O. Box 2227
Sacramento, CA 95810

San Diego Commodore Users Group
Box 86531
San Diego, CA 92138

San Diego PUG
3562 Union Street
San Diego, CA 92101

S.F. Commodore Users Group
278 27th Ave. #103
San Francisco, CA 94121

Marin Commodore Computer Club
620 Del Ganado Road
San Rafael, CA 94903

Delaware

Newark Users Group
Robert Taylor
210 Durso Dr.
Newark, DE 19711

Idaho

64 BUG
P.O. Box 276
Boise, ID 83701

Eagle Rock Users Group
900 s. Emerson
Idaho Falls, ID 83401

Commodore User's Group
310 Emerald Drive
Kellogg, ID 83837

Pocatello Commodore Users Group
82 Mountain Drive
Pocatello, ID 83204

User's Group of Lower Idaho
Route 4, Box 67
Rupert, ID 83350

Caribou Commodore Club
P.O. Box 535
Soda Springs, ID 83276

Maryland

Compucats
Betty Scheuler
680 W. Bel Air Ave.
Aberdeen, MD 20001

FOCUS
Gary Stone
P.O. Box 153
Annapolis, MD 20701

Viclique
Pat Foley
105A Conduit Street
Annapolis, MD 21001

Baltimore Commodore Users Group
John Reynolds
907 W. 36th Street
Baltimore, MD 21211

Westinghouse Commodore Users Group
Lee Barron
Mail Stop 5320 — P.O. Box 1693
Baltimore, MD 21203

Woodlawn Commodore Club
George Towner
1712 Aberdeen Road
Baltimore, MD 21234

The Boyds Connection
Tom DeReggi
21000 Clarksburg Road
Boyds, MD 20841

Southern Md. Commodore Users Group
Tom Helmke
6800 Kilarney Street
Clinton, MD 20735

Hyattsville C-64 Users Group
Kay Carpenter
7209 Dartmouth Ave.
College Park, MD 20740

Gaithersburg C-64 User Group
Russell Jarosinski
12937 Pickering Drive
Germantown, MD 20874

Jumpers 20/64's
Walt Marhefka
7837 B&A Ave.
Glen Burnie, MD 21061

Hagerstown User Group
Joe Rutkowski
23 Coventry Lane
Hagerstown, MD 21740

West Montgomery County C-64 User Group
Mark Richardson
8700 Hidden Hill Lane
Potomac, MD 20854

BAYCUG/ Robert Smith
110 Danbury Road
Reisterstown, MD 21136

Rockville VIC/64 User Group
Tom Pounds
5112 Parklawn Terrace
Rockville, MD 20852

Montgomery County Commodore Users Group
Meryle Pounds
P.O. Box 6444
Silver Spring, MD 20906

Edison Commodore Users Group
Bill Harr
4314 Oxford Drive
Suitland, MD 20746

Massachusetts

Boston Computer Society — CBM Section
Jim Yost
577 Broadway
Boston, MA 02127

Eastern Mass 20/64
Frank Ordway
6 Flagg Road
Marlboro, MA 01752

Minnesota

Metro Area Commodore Club
Box M
Mendota, MN 55150

Don't make the mistake of waiting for the Amiga! — Buy an Apricot now . . . more machine, more software, less money!

Bring in this ad for FREE gift with demonstration

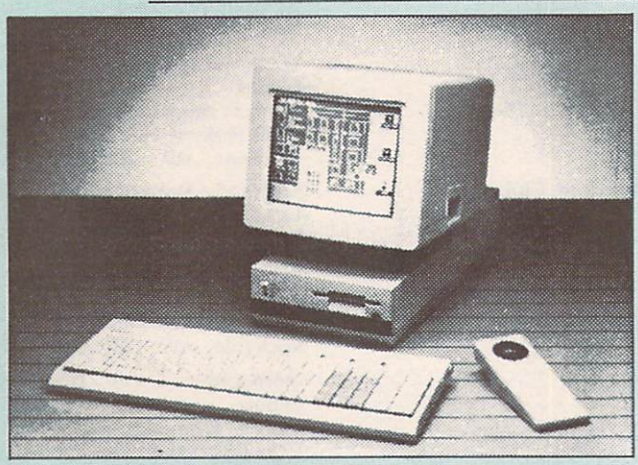
THE 4TH GENERATION COMPUTER

apricot™

MS - DOS PERSONAL COMPUTERS

Now you can see, use and buy the computers that OUTSELL IBM & APPLE COMBINED IN EUROPE. Highlighted by the new F SERIES Apricot Collection featuring the new GEM operating system by Digital Research, with GEM Desktop, GEM Write, and GEM Paint. Undoubtably the best user interface anywhere; over 2500 Apricot MS-DOS software programs already available including all your current favorites: Lotus 123, Symphony, Framework, D-Base, Wordstar, Open Access, Word Perfect. Fully supported by the major software publishers, Ashton Tate, Microsoft, Etc.

FREE **LOTUS™ and WORDSTAR PROFESSIONAL™**
With any Apricot purchased this week.
Yes, even the F-1 at $999.000!!!
$990.00 Retail Value



APRICOT F-1

$999

HERE'S WHAT YOU GET

	Retail Value
F-1 Computer	$995.00
GEM	$195.00
Apricot Mouse	$195.00
MS DOS	N/C
Lotus 123	$495.00
Total Retail Value	$1880.00

The Apricot Collection has been specifically designed for low cost business computing with unparalleled ease of use. Featuring the GEM graphic user interface, a standard 512k of RAM (expandable to 768k), double-sided 3.5" disk drive, cordless infra-red keyboard and mouse, and color electronics enabling the F series to display color on a wide variety of monitors, they set a new standard in entry-level business computing. Color cards already installed in all units.

F1 512K GEM/MOUSE	$ 999.00	(single 3.5" disk drive)
F2 512K GEM/MOUSE	$1,495.00	(twin 3.5" disk drives)
F10 512K GEM/MOUSE	$1,995.00	(10 megabyte hard disk)

Available Monitors: 9" Mono $295.00
12" Mono $345.00
10" Sony Color $495.00
Color cards already installed in all units

The Apricot PC

16-bit processor.
256K RAM.
Micro Screen

$1695

MS-DOS. Two 3½" Sonydiskettes (720 kb each).
Optional mouse.

The Apricot xi

16-bit processor.
512K RAM.
Micro Screen

$2995

Winchester hard disk (10 Mb).
3½" Sony diskette (720 Kb).
Optional mouse.

Q. What type of processor is used?
A. The heart of the system is an Intel 8086, which operates with an 8089 I/O microprocessor. An 8087 math co-processor is also available as an option.

Q. How much memory is available, and is it expandable?
A. The Apricot comes with 256K or 512K RAM expandable or 1 megabyte non-expandable.

Q. Can the Apricot be connected to larger computers?
A. Yes.

Q. Is there any application software for the Apricot?
A. ACT has contracts with the top software developers to suply software for the Apricot. At present there are over 3000 titles available worldwide.

This month, the purchase of either the PC or the xi models includes a FREE 12" monochrome monitor.

Comp-u-Desk

BEAVERTON MALL	JANTZEN BEACH MALL	CLACKAMAS TOWN CENTER	NOW OPEN AT WASHINGTON SQUARE TOO	NOW OPEN IN SALEM
INSIDE PAYLESS STORE OPEN 7 DAYS	OPEN 7 DAYS	OPEN 7 DAYS	(FACING GREENBURG ROAD NEXT TO COMP-U-SHOP) OPEN 7 DAYS 10-9	1911 LANCASTER DRIVE N.E.
626-0175	286-8444	652-2525	620-6430	581-1829

CAPT. COMP-U-DESK SEZ:

New Jersey

South Jersey Commodore Users Group
Mark Orthner
P.O. Box 420
Cherry Hill, NJ 08034

Somerset Users Group
Stan Kosciuk
5 Shasta Pass
Fanwood, NJ 07023

RCA Commodore Users Group
William Rowe
432 Hemlock Lane
Mount Holly, NJ 08060

New York

Manhattan 64
Greg Pumroy
139 Guernsey Street #1R
Brooklyn, NY 11222

Queens Commodore Users Group
Sam Soltan
67–42 Harrow Street
Forest Hills, NY 11375

Long Island VIC Enthusiasts
Arnold Friedman
17 Picadilly Road
Great Neck, NY 11023

Upstate Commodore Users Group
Chris Johnson
P.O. Box 5242 Arnot Mall
Horseheads, NY 14844

Vic/64 User Group
John Mason
249 S. 14th Street
Lindenhurst, NY 11757

Metropolitan Life Insurance Users Group
Harry Kristy
P.O. Box 618
New York, NY 10159

New York Commodore User's Group
Shelly Roberts
135 Charles Street, Apt. 4-E
New York, NY 10022

"CitiiGroup"
N.Y. Vic 20/C-64 User Group
C/O N.Y. Amateur Computer Club
Attn: Brian Glover
P.O. Box 106
Church Street Station
New York, N.Y. 10008

Oswego Commodore Users Group
Dr. John Boronkay
Dept. Industrial Arts & Technology
SUNY
Oswego, NY 13321

Schenectady Commodore Users Group
Bill Pytlovany
7 Center Street
Scotia, NY 12302

North Carolina

Commodore Users Group of Fayetteville
Steve Peterson
612 Brittany Place
Fayetteville, NC 28304

Hendersonville Users Group
Jerry Baldwin
Rt. 6 — Box 101
Hendersonville, NC 28739

Ohio

Clercom 64
Wally Jones
5152 Benton Road
Batavia, OH 45103

Central Ohio Commodore Users Group
Philip Lynch
P.O. Box 28229
Columbus, OH 43228-0229

C-64 Users of Philadelphia
Bonnie Mackie
1292 Bluebird, SW
Dellroy, OH 44620

CPU Connection
Bob Zak
10201 Plymouth
Garfield Heights, OH 44125

Cincinnati Commodore Computer Club
Attn: Wally Jones
P.O. Box 450
Owensville, OH 45160

Oregon

Albany/Corvallis 64 Users Group
Al Rasmus: (503) 967–8701
Steve Johnson: (503) 752–7614

Astoria Commodore Users Group
Kent Paulsen: (503) 325–5685

Beaverton 64 Users Group
Jack Simpson
(503) 646–9596

Coos Computer Club
P.O. Box 4066
Eastside, OR 97529

Lane County C-64 Users Group
P.O. Box 11316
Eugene, OR 97440
(503) 726–2131

Springfield Commodore Users Group
4400 Franklin Ave., Suite 1443
Eugene, OR 97403
(503) 741–2522

Oregon Commodore Computer Users Group
Bob Koch
6179 S.W. Carman Drive
Lake Oswego, OR 97034
(503) 636–3432

Milwaukie Commodore Users Group
Mike Garvin: (503) 255–1376

Mt. Hood Community College Users Group
John Januzzi
(503) 663–1900

Southern Oregon VIC/64 Users Group
P.O. Box 765
Phoenix, OR 97501

North Portland Commodore Users Group
VIC-20 SIG
Doug McMurdo: (503) 245–2571
C-64 SIG
Gary Thompson: (503) 666–4131

Salem 64 Users Group
3795 Saxon Drive S.
Salem, OR 97302

Columbia County Commodore Club
Gary Thomas
424 South 17th Street
St. Helens, OR 97051

Columbia Commodore Computer Users
Ken Denniston
1214 Washington
The Dalles, OR 97058
(503) 298–5965

Yamhill County Commodore Users
Route 2, Box 246
Sheridan, OR 97378

Pennsylvania

Lehigh Valley Commodore User Group
Hiram Cook
2228 Baker Drive
Allentown, PA 18102

Ft. Indiantown Gap Commodore Club
William Fuerst
Bldgs 9–11, Mail & Distribution
Ft. Indiantown Gap
Annville, PA 17003

Scranton Commodore Users Group
Mark Davis
P.O. Box 211
Clarks Summit, PA 18411

NEPACC Commodaters
P.O. Box 644
Conyngham, PA 18219

North Coast Commodore Users Group
Dale Niedzielski
P.O. Box 493
Fairview, PA 16415

Westmoreland Computer Users Club:
Commodore Section
Jim Mathers
3021 Ben Venue Drive
Greensburg, PA 15601

Capital Area Commodore Club
Brad Mitchell
1089 D Michigan Drive
Harrisburg, PA 17111

Indiana Commodore Users Group
Richard Halapin
98 Rex Ave.
Indiana, PA 15613

Wyoming Valley Commodore Users Group
John Youells
94 Second Ave.
Kingston, PA 18704

Eight Squared
Mindy Skelton
P.O. Box 76
Mt. Holly Springs, PA 17065

Sperry-New Holland Users Group
John Bowman
500 Diller Ave.
New Holland, PA 17557

Philadelphia Area Computer Society — CBM Section
Dennis Sosna
919 E Godfrey Ave.
Philadelphia, PA 15236

Pittsburgh Commodore Group
Joel Casar
2015 Garrick Drive
Pittsburgh, PA 15235

Main Line Commodore Users Group
Emil Volcheck
1046 General Allen Lane
West Chester, PA 19380

South Pittsburgh Commodore Users Group
Chuck Groves
2407 Pennsylvania Ave.
West Mifflin, PA 15122

West Branch Commodore Users Group
Gene Loveland
P.O. Box 995
Williamsport, PA 17703

Virginia

Franconia Commodore Users Group
Mark Sowash
6209 Rose Hill Drive
Alexandria, VA 22310

Navair Commodore Users Group
Jon Steeby
4423 Raleigh Ave. #102
Alexandria, VA 22304

Arlington Victims (20/64)
Clifton Gladney
4501 Arlington Blvd.
Arlington, VA 22204

Dale City Commodore Users Group
Pat Sullivan
4303 Hemingway Drive
Dale City, VA 22193

Piedmont Users Group
David Gray
135 Beverly Road
Danville, VA 24514

PENTAF (Pentagon)
Ralph Poole
9912 Colony Road
Fairfax, VA 22030

Franklin Users Group
Bruce Powell
1201 North High Street
Franklin, VA 23815

Fredricksburg CCC
Steve Northcutt
Box 1011 College Station
Fredricksburg, VA 22402

Washington Area C-64 User Group
Martin Smith
7426 Eldorado Street
Mclean, VA 22012

Washington Area C-64 User Group
Dick Jackson
P.O. Box 93
Mt. Vernon, VA 22121

Tidewater Commodore Users
P.O. Box 61814
Virginia Beach, VA 23462

Washington

CBM User's Group
c/o Rick Beaber
803 Euclid Way
Centralia, WA 98531
(206) 736-4085

Edmonds Commodore Users Group
Rick Ellis
(206) 776-3539

Longview Commodore Users Group
Dan Davis
(206) 577-8224

East Seattle Commodore Users Group
Erik Moseid
(206) 883-7404

PET Users Group
1800 Taylor Ave. N102
Seattle, WA 98102

NW PET Users Group
2565 Dexter N. 3203
Seattle, WA 98109

Spokane Commodore User Group
N. 4311 Whitehouse
Spokane, WA 99205

World Wide User Group
R. Smith
P.O. Box 98682
Tacoma, WA 98498
(24-Hr. BBS: (206) 535-0574

Vancouver VIC/64 Users Group
Bruce Qualman
(206) 256-7206

Blue Mountain Commodore Users
Jim Godfrey, Secretary
550 South 2nd Ave.
Walla Walla, WA 99362-3149
(509) 529-4663

Central Washington Users Group
1222 S. First Street
Yakima, WA 98802

Attention Users' Groups

Would you like to have your users' group included in our directory? If so, just write the information you wish listed on a post card, and mail it to *The Guide* at the address below.

Also, please add *The Guide* to your group newsletter mailing list.

Send all correspondence to:

The Guide to Computer Living
Attn: User Group Directory
P.O. Box 22184
Portland, OR 97222

The Guide TO COMPUTER LIVING

A Monthly Publication For Commodore™ Owners

Formerly The Northwest Users Guide

Commodore support with a twist ... Personable and even humorous ... Timely news ... Helpful tutorials ... On-going support for several languages: BASIC (including BASIC 7.0 as featured in the new 128 PC), Machine Language, COMAL, Pascal ... Program Listings ... *Honest* Software reviews ... and much more ...

The Guide features some of the best computer humorists to be found.

- Introduce your "widow" to the Computer Widow's Compendium.
- Tutorials and feature articles by the infamous Mindy Skelton.
- Featuring Shelly Roberts' "I'm Sorry, But I Don't Speak Hexidecimal." Discover why Shelly just may be the Andy Rooney of the computer world!

We feel we have assembled one of the most talented staff of writers in the Commodore world. Receive each month the most friendly and helpful Commodore publication available. Written by Commodore users who are writing to you, not down at you.

Limited offer — While Supplies Last

Receive FREE High Quality Software with Each Subscription

One Year.....$18.00
(Canadian Rate–$24.00 U.S.*)

Receive FREE Either:

Omiterm Terminal Program

Fully supports the new 1660 Modem 300!
•Modem controls accessible from the keyboard
•Punter protocol — upload & download — 300/1200 baud
•Auto dial/re-dial
•Half/full duplex

$19.95 value.

OR:

Gold Disk

Choose one of the popular Canadian series disks — Each disk contains:
• Programming Tutorials
• Games
• Utilities
Top Quality Software!

$14.95 value.

Two Year.....$35.00
(Canadian Rate–$47.00 U.S.*)

Receive FREE Either:

Donald Duck's Playground

CES Software Showcase Award Winner! — Disney animation at its best! Children play four games to "earn" money to buy playground equipment. Builds money handling skills. Superb graphics. A bestseller!

$29.95 value.

OR:

Winnie The Pooh In The Hundred Acre Wood

Players explore the Hundred Acre Wood to find lost articles like Owl's books, Pooh's honey pot and Eeyore's tail, and return them to their rightful owners. Cheery music from the Disney movie caps off this computer rendition of the beloved classic.

$29.95 value.

Three Year.....$48.00
(Canadian Rate–$64.00 U.S.*)

Receive FREE:

Mind Prober

A personality program analysis program that helps you understand what makes your friends "tick". Answering a few simple questions about someone can reveal personality traits you might never have suspected. Amazingly accurate.

29.95 value

*** Canadian Orders Add $2.00 to Cover Software Shipping**

The Guide
3808 S.E. Licyntra Ct.
Portland, OR 97222
To Order by Phone, Call: (503) 654-5603

Name _____

Address _____

City, State & Zip _____

Please Enter My Subscription for:

☐ **1 Year** ☐ **2 Years** ☐ **3 Years**

Please Check One: ☐ **New** ☐ **Renewal**

☐ VISA ☐ MasterCard

Card # _____

Exp. Date _____

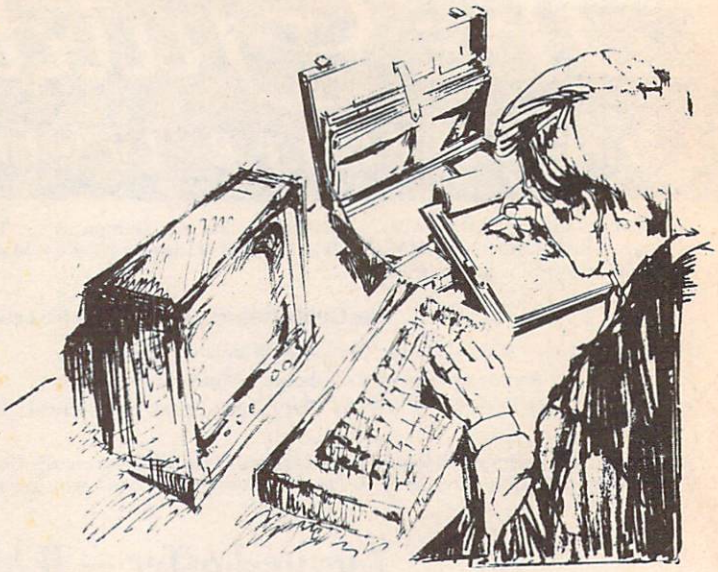
Signature _____

My choice of free software, in accordance with the above offer, is:

_____

_____

How To Type In Program Listings From The Guide



In order to typeset programs so that clear images may be printed in the pages of *The Guide*, it was necessary to deal with the problem of graphics characters that appear on the screen when you type in a capital letter in graphics mode, or when you choose graphic symbols for colors (instead of using POKEs, which occupy more memory space in your programs), etc.

To begin with, all programs appear in the text mode. You enter the text mode by pressing the Commodore key and the shift key simultaneously. This solves the problem of capital letters.

The other graphic symbols are replaced with letters the typesetting machine can recognize. For example, if the program shows [lt grn], you simultaneously press the Commodore key and 6, causing the graphic symbol for light green to be shown on your screen.

We hope this helps clear up any confusion you may have experienced. If you have any questions, please feel free to contact us. Have fun!

Program Shows:	Press Keys:	Screen Shows:
[blk]	ctrl–1	
[wht]	ctrl–2	
[red]	ctrl–3	
[cyn]	ctrl–4	
[pur]	ctrl–5	
[grn]	ctrl–6	
[blu]	ctrl–7	
[yel]	ctrl–8	
[rvs on]	ctrl–9	
[rvs off]	ctrl–0	
[orange]	Cmdr–1	
[brown]	Cmdr–2	
[lt red]	Cmdr–3	
[gray 1]	Cmdr–4	
[gray 2]	Cmdr–5	
[lt grn]	Cmdr–6	
[lt blu]	Cmdr–7	
[gray 3]	Cmdr–8	
[clr]	Shft–Clr	
[home]	Home	
[up]	Crsr–Up	
[dwn]	Crsr–Down	
[left]	Crsr–Left	
[right]	Crsr–Right	
[f1]	f1	
[f3]	f3	
[f5]	f5	
[f7]	f7	
[up-arrow]	Up Arrow	

NEXT MONTH IN THE GUIDE

☐ **Word processors for the 128 PC:**

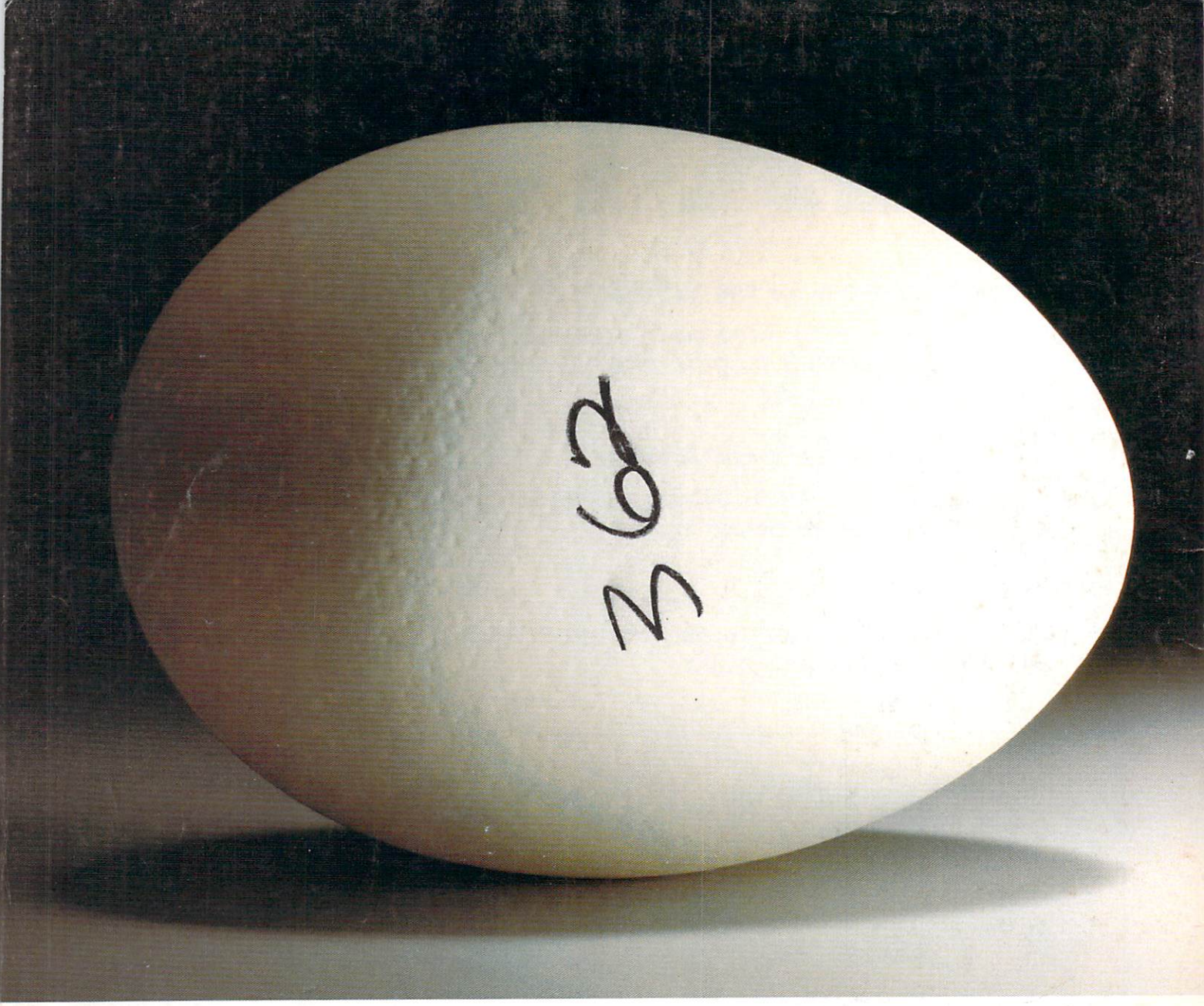
In depth reviews of three word processors designed specifically for the 128. Fleet System 3, Superscript 128 and Paperclip; — how much better can the best get?

☐ **The Software side of the Amiga.**

Dazzling chips and lots of memory are just part of the story. The Amiga is smart when you power up.

☐ **Plus Lots More!**

All the regular columns and features, including the Computer Widow and more computer magic!



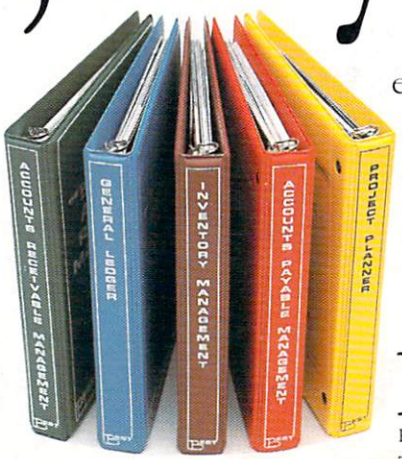
Simple, easy to use.

Professional quality defines new B.E.S.T. software business management systems for the Commodore 64/128.* Ease of use is unique. Manuals are illustrated, readable and easy to understand. Menus are clear and concise.

B.E.S.T. software gives you more time to focus on business. (No need for computer or accounting experience.) B.E.S.T. systems *seem* simple. Yet this is very sophisticated software, easily capable of becoming the indispensible management tool.

Our objective is to make your business easier to manage.

Available at your local computer store.



Prices: Payables & Receivables, $59.95 each; Inventory & Ledger $69.95 each; Project Planner, $89.95.

*Trademark of Commodore Business Machines, Inc.

B.E.S.T. Business Electronics Software & Technology, Inc.
P.O. Box 852 / McMinnville, Oregon 97128 / (503) 472-9512
Toll Free 1-800/368-BEST